McKinsey Global Institute

October 2014

A blueprint for addressing the global affordable housing challenge

The McKinsey Global Institute

The McKinsey Global Institute (MGI), the business and economics research arm of McKinsey & Company, was established in 1990 to develop a deeper understanding of the evolving global economy. Our goal is to provide leaders in the commercial, public, and social sectors with the facts and insights on which to base management and policy decisions. MGI research combines the disciplines of economics and management, employing the analytical tools of economics with the insights of business leaders. Our "micro-to-macro" methodology examines microeconomic industry trends to better understand the broad macroeconomic forces affecting business strategy and public policy. Current research focuses on six themes: productivity and growth, natural resources, labor markets, the evolution of global financial markets, the economic impact of technology and innovation, and urbanization. Recent reports have assessed job creation, resource productivity, cities of the future, the economic impact of the Internet, and the future of manufacturing.

MGI is led by three McKinsey & Company directors: Richard Dobbs, James Manyika, and Jonathan Woetzel. Michael Chui, Susan Lund, and Jaana Remes serve as MGI partners. The partners of McKinsey & Company fund MGI's research; it is not commissioned by any business, government, or other institution. For further information about MGI and to download reports, please visit www.mckinsey.com/mgi.

The McKinsey Infrastructure Practice

Infrastructure is a cornerstone of a stable and productive society. The right approach to delivering and maintaining transport, housing, energy, water, and communication infrastructure is essential to create a strong and competitive economy and provide social services. Infrastructure presents unique challenges and opportunities for the public and private sectors.

The McKinsey Infrastructure Practice helps clients to determine what to build, how to do so more quickly and cost efficiently, how to invest in infrastructure, and how to enhance the value of existing infrastructure. The practice serves infrastructure planners, builders, owners, investors, and operators. Over the past four years, the team has advised private companies and public entities on more than 850 projects. The practice is active in all geographies, asset classes, and project stages from planning and financing to delivery and operation. Worldwide, more than 70 consultants work closely with colleagues in practices including those relating to travel, transport and logistics, the public and social sector, corporate finance, and operations.

The McKinsey Public Sector Practice

In an increasingly complex environment, government must do more with fewer resources. Macroeconomic vulnerability and uncertainty mean the state is an increasingly important market player. Demographic changes in advanced economies and urbanization in developing economies put new demands on public services. Globalization requires increased collaboration across governments, agencies, and international institutions. Digitization raises citizens' expectations for transparency and productivity.

The McKinsey Public Sector Practice works with the world's leading public-sector organizations to address such challenges. Our work spans economic development, education, health care, public finance, energy, the environment, and security. We have served organizations in more than 85 countries and have completed more than 1,500 engagements in the past five years.

Copyright © McKinsey & Company 2014

McKinsey Global Institute

October 2014

A blueprint for addressing the global affordable housing challenge

Jonathan Woetzel
Sangeeth Ram
Jan Mischke
Nicklas Garemo
Shirish Sankhe

Preface

Providing decent housing for citizens is a perennial challenge for nations around the world. From slum residents in the developing world to middle-income households in expensive global capitals, hundreds of millions of people struggle to find decent housing that they can afford without severe financial stress. The economic and human toll of the housing affordability gap is enormous. We estimate that 330 million households are affected around the world and, under current trends, by 2025 the number of households that occupy unsafe and inadequate housing or are financially stretched by housing costs could reach 440 million—or 1.6 billion people.

In this research we identify ways to narrow the affordable housing gap in the next decade. This will require clear aspirations by policy makers to improve housing affordability and the use of four levers that we identify to unlock land in appropriate locations, reduce construction and operations costs, and improve access to low-cost financing. Together with an integrated and city-specific delivery approach, these measures can put housing within reach of households making 50 to 80 percent of their city's median income. The levers also can make housing more affordable and improve housing outcomes for households earning less than 50 percent of median income.

This research is a collaboration between the McKinsey Global Institute, the firm's business and economic research unit, and the firm's Infrastructure and Public Sector practices. The work was led by Jonathan Woetzel, an MGI director in Shanghai, Jan Mischke, an MGI senior fellow, and Sangeeth Ram, a partner in Dubai. The research team was led by Aditi Ramdorai and Ayoub Semaan and included Stephanie Brown, Nicola Chiara, Ashwin Hasyagar, Ryo Ishida, Jhonny Jha, Dina Shalaby, Maximilian Stoiber, and Richard Sun. Valuable guidance was provided by Nicklas Garemo, a director in Abu Dhabi; Shirish Sankhe, a director in Mumbai; and Jorg Schubert, a partner in Dubai.

We are grateful for the advice and input of many McKinsey & Company colleagues, including Tobias Baer, Albert Bollard, Killian Clarke, Tony D'Emidio, Mikhail Dmitriev, Jakub Fast, Lucia Fiorito, Tony Goland, Johan Hesselsoe, Eduardo Doryan Jara, Ivan Jelic, Szabolcs Kemeny, Antti Koulumies, Eric Lauer, Oscar Lingqvist, Rachid Maalouli, Murdock Martin, Vadim Pokotilo, Björn Sass, Sebastian Schneider, Yakov Sergienko, Sapna Sharma, Venkataramamoorthy Sreeramagiri, and Raghuram Talluri. Geoffrey Lewis provided editorial support, and the team would like to thank Marisa Carder, MGI senior graphic designer; Julie Philpot, MGI's editorial production manager; Rebeca Robboy, MGI external relations manager; Kay Scott, Infrastructure external senior communications manager; and McKinsey's geospatial analytics team.

We also thank our external contributors who helped us in specific areas. Friedemann Roy, global product lead housing finance access, International Finance Corporation, co-developed the financing chapter of this report. Christian Prilhofer, an expert on industrial production of buildings and president of Prilhofer Consulting, gave us valuable input on industrial approaches to construction. P. S. Jayakumar, managing director of Value & Budget Housing Corporation, shared his unique perspective on India's affordable housing challenge.

We are indebted to the many experts from industry and academia who have contributed to this work. In particular, we thank Richard Barkham, global chief economist, CBRE Group; Luca Bertalot, secretary general of the European Covered Bond Council; Alain Bertaud, senior research scholar at the New York University Stern Urbanization Project; Inga Björk-Klevby, former deputy executive director, United Nations Human Settlements Program; Thomas Davidoff, assistant professor, Strategy and Business Economics Division, Sauder School of Business, University of British Columbia; Nader Elhajj, director for the Middle East, Africa, and Europe, FRAMECAD; Liu Thai-Ker, senior director, RSP Architects Planners and Engineers, chairman of the Centre for Liveable Cities advisory board, and former chief executive officer, Housing and Development Board of Singapore; Christophe Lalande, leader, housing unit at UN-Habitat; Charles S. Laven, founder and president, Forsyth Street; Benjamin T. Metcalf, deputy assistant secretary, US Department of Housing and Urban Development; Jerry Speyer, chairman and co-CEO, Tishman Speyer; Vishnu Swaminathan, leader of South Asia, Ashoka Innovators for the Public; Rafael Tuts, chief, Urban Environment and Planning Branch, UN-Habitat; and Simon Walley, coordinator, Housing Finance Program, Capital Markets Practice, World Bank Group.

We also thank our academic adviser, Martin N. Baily, the Bernard L. Schwartz Chair in Economic Policy Development at the Brookings Institution.

Richard Dobbs
Director, McKinsey Global Institute
Seoul

James Manyika
Director, McKinsey Global Institute
San Francisco

Jonathan Woetzel
Director, McKinsey Global Institute
Shanghai

October 2014

Contents

Executive summary 1

1. Affordable housing is a global challenge and opportunity 23

2. Narrowing the affordability gap 39

Housing programs should be based on a broad vision of a housing ladder, with improving outcomes 40

Four levers can substantially narrow the affordability gap 46

Unlocking land supply at the right location is the most critical step in providing affordable housing 48

An industrial approach is essential to deliver housing quickly, on a large scale, and at the desired cost 74

Efficiencies in operations and maintenance can reduce costs and preserve sound housing stock 98

Expanding access to lending and reducing financing costs can help buyers and developers of affordable housing 106

3. Creating the right delivery platform for each city 131

4. Strategies and tools to tackle affordable housing: City case studies 155

Appendix A. Calculating the affordability gap 181

Appendix B. Detailed list of sub-levers for affordable housing programs 184

Bibliography 191

IN BRIEF

A blueprint for addressing the global affordable housing challenge

Access to decent, affordable housing is so fundamental to the health and well-being of people and the smooth functioning of economies that it is imbedded in the United Nations Universal Declaration of Human Rights. Yet in developing and advanced economies alike, cities struggle with the dual challenges of housing their poorest citizens and providing housing at a reasonable cost for low- and middle-income populations. In this report, we look at the dimensions of this problem—and how it will grow over the next decade—and offer a set of solutions that can narrow the affordable housing gap. Among our key findings:

- We estimate that 330 million urban households around the world live in substandard housing or are financially stretched by housing costs. Some 200 million households in the developing world live in slums; in the United States, the European Union, Japan, and Australia, more than 60 million households are financially stretched by housing costs.

- Based on current trends in urban migration and income growth, we estimate that by 2025, about 440 million urban households around the world—at least 1.6 billion people—would occupy crowded, inadequate, and unsafe housing or will be financially stretched.

- The housing affordability gap is equivalent to $650 billion per year, or 1 percent of global GDP. In some of the least affordable cities, the gap exceeds 10 percent of local GDP.

- To replace today's substandard housing and build additional units needed by 2025 would require an investment of $9 trillion to $11 trillion for construction; with land, the total cost could be $16 trillion. Of this, $1 trillion to $3 trillion may have to come from public funding.

- We identify four ways to reduce the cost of delivering affordable housing by 20 to 50 percent: unlock land at the right location (the most important lever), reduce construction costs through value engineering and industrial approaches, increase operations and maintenance efficiency, and reduce financing costs for buyers and developers.

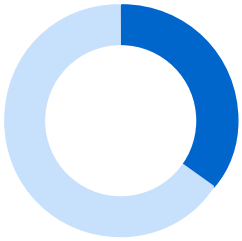
- These largely market-based measures can benefit households in all income groups and, with some cross subsidies, can reduce costs sufficiently to make housing affordable (at 30 percent of income) for households earning 50 to 80 percent of area median income.

- Affordable housing is an overlooked opportunity for developers, investors, and financial institutions. Building units for 106 million more poor urban households by 2025 could require more than $200 billion a year and account for 7 percent of mortgage originations.

These findings indicate that new approaches are needed. Standard approaches to affordable housing will yield only standard—and inadequate—results. Cities need to think more broadly and creatively about a housing ladder that includes affordable housing but accommodates citizens of all income groups and their changing needs. For the poorest citizens, the ladder may start with very basic housing that places people in decent accommodations and connects them to employment and society. To turn these aspirations into reality, cities will need smoothly functioning "delivery platforms."

Affordable housing is defined by three parameters, which cities need to tailor to their local contexts

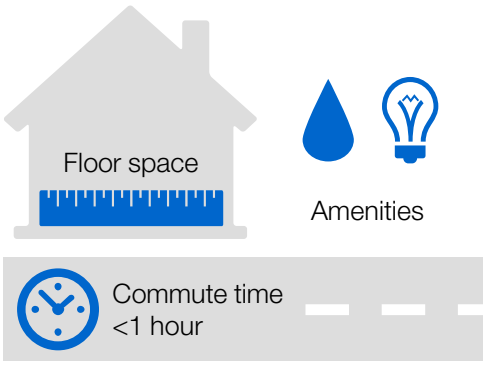
Affordability threshold



30–40%
of income
on housing

60–70%
of income on food, health care, and other expenses

Standard unit



Income threshold

80% area
median income

The challenge today …

96 million
urban households are
financially overstretched

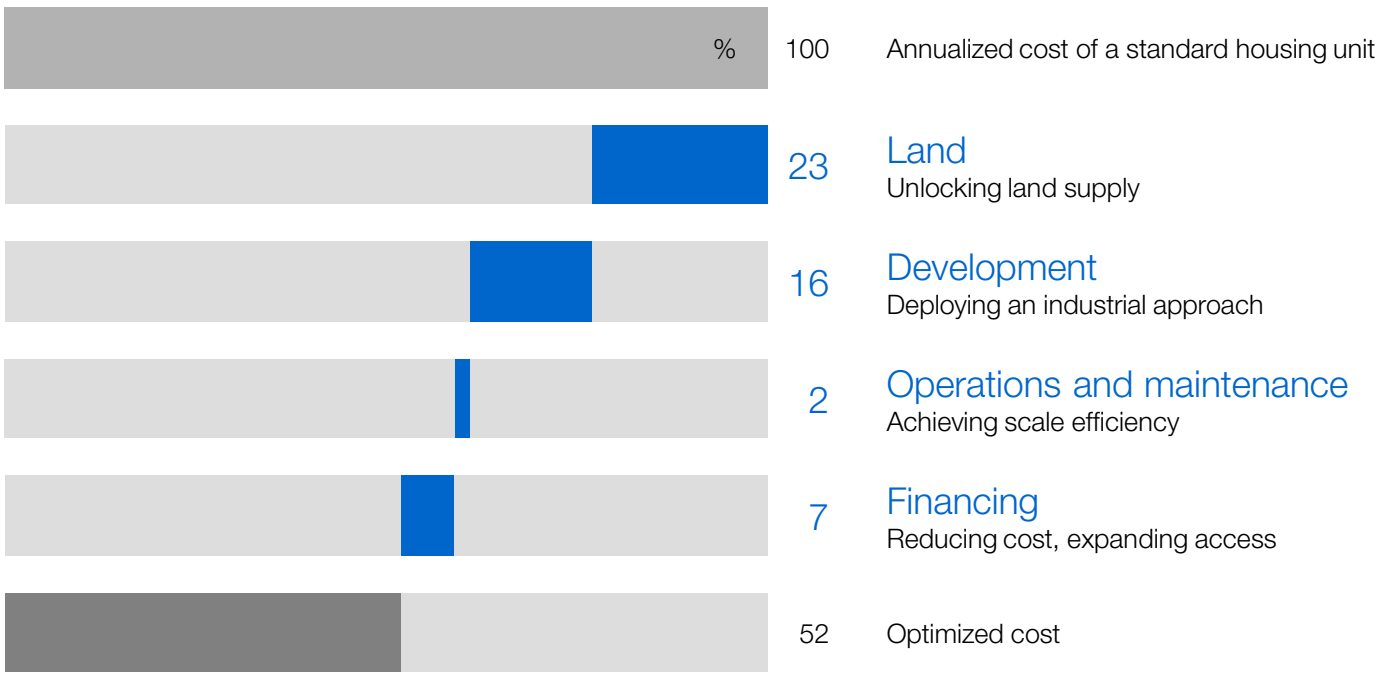
235 million
urban households live in
substandard housing

… and by 2025

106 million additional low-income households
will face the affordability housing challenge

… affecting 1.6 billion people or
one-third of urban population

Four levers can address the global affordable housing challenge



Executive summary

The struggle to obtain decent, affordable housing could affect at least 1.6 billion people globally within a decade, leaving more than a third of all urban dwellers in unsafe or inadequate housing or financially stretched by housing costs. The four levers that we lay out in this report, combined with effective local delivery, can bring decent homes within reach of hundreds of millions of households and narrow the affordable housing gap.

Affordable housing is a global challenge—and an opportunity

Affordable housing is a global challenge for cities in both developing and advanced economies. Based on a broadly accepted definition of affordable housing (see Box E1, "Defining affordable housing"), 330 million urban households around the world today lack decent housing or are so financially stretched by housing costs that they forgo other basic needs, including food, health care, and schooling for children.

Box E1. Defining affordable housing

The definition of "affordable housing" varies across economies, but generally it includes a financial component (the share of income devoted to housing), a standard for what constitutes minimum socially acceptable housing with a clear idea of what income groups are affected, and at what income level households should be eligible for housing assistance.

The definition should accommodate a range of sizes, tenure options (purchase vs. rental), and affordability thresholds that take into account households of different sizes and incomes in the area. In many parts of the world, "affordability" is defined as housing costs that consume no more than 30 to 40 percent of household income; we use 30 percent for our estimates.

A basic socially acceptable standard housing unit is defined by a particular community's view of what is required for decent living and this varies by city. How much floor space is required in a standard unit reflects consumer choices, market conditions, and regulatory constraints. The definition should also include minimum standards for basic amenities (running water, a toilet) as well as access to essential social services such as schools and health clinics. An acceptable housing unit should also place workers no more than an hour's commute from centers of employment.

Finally, as cities define affordable, socially acceptable housing to inform policy making, they should define which kinds of households will be the beneficiaries of policies, particularly which types of households will require direct government support. In our analysis, we focus on the affordability gap for households earning 80 percent of the area median income or less. Great care needs to be exercised when setting definitions for use in policy making. A floor-space standard for a housing unit that is set too high could result in overpriced units for low-income residents and push more households into the informal housing sector.

AT LEAST 1.6 BILLION PEOPLE IN URBAN AREAS COULD BE AFFECTED

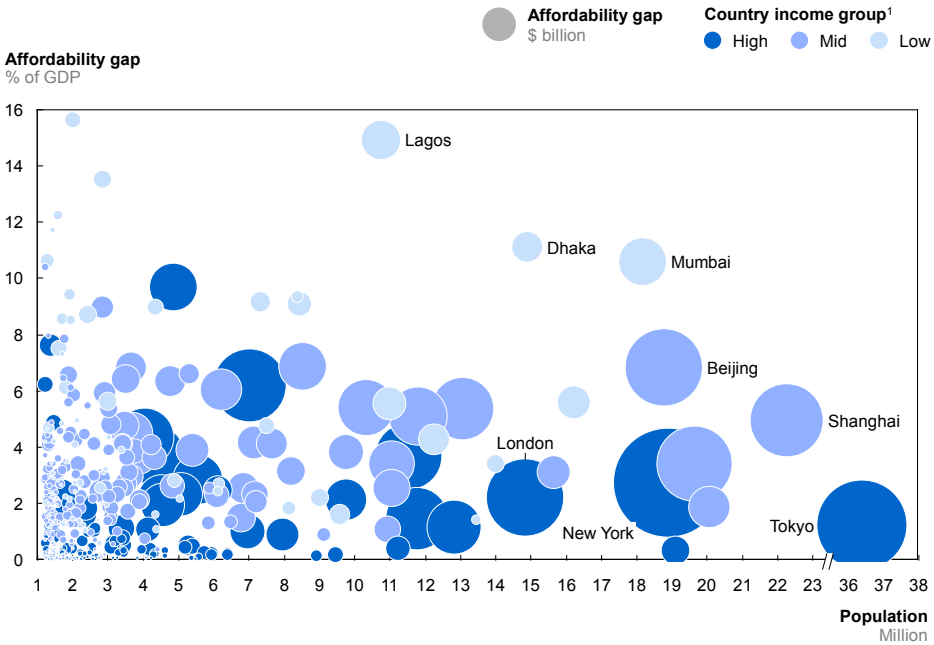
If current trends in urbanization and income growth persist, the affordable housing gap would grow from 330 million urban households to 440 million by 2025, leaving at least 1.6 billion people living in substandard housing or financially stretched by housing costs. This estimate is based on an analysis of incomes and housing in more than 2,400 cities around the world—essentially all cities with populations exceeding 200,000—and counts households earning less than 80 percent of area median income that cannot secure a minimum acceptable housing unit for 30 percent of their income. The number of households having affordability challenges would be higher if the data included all urban areas and we measured the affordability gap for households at all income levels.

The estimate of the 2025 housing challenge (440 million households) includes about 200 million existing households in developing economies and an estimated 32 million households in advanced economies whose housing is inadequate, as well as around 100 million households that are financially stretched. In addition, we include an estimate of 106 million more urban households by 2025 that are likely to be unable to afford decent housing.

In monetary terms, we estimate that the affordability gap could be $650 billion per year, approaching 1 percent of global GDP. This figure includes housing payments that exceed 30 percent of income by households in the 2,400 cities we analyze, the cost of government housing assistance programs, and the implied cost of bringing substandard housing up to standards. More than two-thirds of the gap is concentrated in 100 large cities (Exhibit E1). In several low-income cities, such as Lagos and Mumbai, the affordable housing gap can amount to as much as 10 percent of area GDP.

Exhibit E1

We have sized the affordability gap for approximately 2,400 cities



1 As defined by World Bank.

SOURCE: World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos; Exame; Notaires Paris Ile de France; Jones Lang LaSalle; McKinsey Global Institute Cityscope database; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

The enormity of the economic affordability gap underscores why this challenge cannot be met with government subsidies and income support alone. The good news is that there are market-based approaches that create value while reducing costs. The levers we describe in this report, if applied systematically and in appropriate ways for the local context, can help cities narrow the affordability gap.

Addressing the affordable housing gap will likely take on increasing urgency as the number of affected households grows and the negative spillover effects multiply. Based on the projected rate of urbanization around the world, we estimate that the number of people affected by the affordable housing gap could rise to 1.7 billion in 2030 and 1.8 billion in 2035. This would exact an enormous toll on society. For families lacking decent affordable housing, health outcomes are poorer, children do less well in school and tend to drop out earlier, unemployment and under-employment rates are higher, and financial inclusion is lower.

AFFORDABLE HOUSING FOR ALL WOULD REQUIRE A $16 TRILLION CAPITAL OUTLAY OVER DECADES

The prospect of trying to fill a gap of 440 million housing units that will be required by 2025 may seem daunting to policy makers, but it could represent a massive opportunity for the private sector. The investment associated with building the housing needed to close this gap would be $9 trillion to $11 trillion for construction alone.[1] With the cost of land, we estimate the total could be as much as $16 trillion. We estimate that the share of the $16 trillion that would need to come from public sources—the "viability gap"—could be $1 trillion to $3 trillion. However, the size of viability gap funding required will vary significantly across cities.

This estimate of capital expenditure entails building affordable housing units to replace existing substandard units as well as new housing for the additional low-income urban households that would be added from 2012 to 2025. Building homes for the 106 million new low-income households by 2025 alone could cost $2.3 trillion, representing a construction market of $200 billion to $250 billion annually, or about 10 percent of the global residential real estate construction industry. The largest markets for new construction for low-income housing units in 2025 would be in China, Russia, India, Brazil, and Nigeria.

Affordable housing also provides an opportunity for the finance sector. Mortgage issuance of $300 billion to $400 billion per year could be needed by 2025 to fund purchases of new affordable housing (not including the financing required to redevelop current substandard units). This would be equivalent to about 7 percent of global new mortgage origination volume in 2025.

1 The upper bound of our estimate is based on current construction cost estimates; the lower bound represents estimates of affordable housing construction costs that have been optimized by use of industrial construction techniques and other measures described in Chapter 2.

Box E2. Myths and realities about affordable housing

Myth 1: There is no economic case for affordable housing.
Reality: Affordable housing can raise productivity. Affordable housing in the right locations boosts the city's productivity by integrating lower-income populations into the economy and reducing costs to provide shelter and services. It enables labor mobility, opening a path to rising incomes, giving households more to spend on goods and services in their neighborhoods and, over time, enabling them to move up the income pyramid and help drive city GDP growth.

Myth 2: Upper-income and lower- income housing markets are independent.
Reality: A city is an integrated housing market with a mixture of incomes. Cities need to think of housing as one market, in which decisions at the top trickle down through all income groups and where market failures in any submarket have ramifications across the city. In a vibrant housing market, building new housing for upper income segments will ultimately free up housing for middle- and lower-income groups, either for rental or ownership.

Myth 3: Addressing the affordable housing gap means investing in new buildings.
Reality: Renewal is as important as new building. The existing housing stock and new units are complementary parts of the same solution. Existing housing, even in poor condition, may serve residents better by placing them where they have social connections and access to employment. Cities need to provide housing where residents can flourish, whether by building new units or supporting refurbishment, repairs, and upgrading of existing stock.

Myth 4: Cities can guarantee decent housing by imposing high standards.
Reality: Affordable housing is part of a "ladder" of rising housing aspirations. Uniform standards that are set too high can price poor households out of formal housing (without subsidies). It may be better to provide basic, safe shelter in appropriate locations, even with limited space or communal facilities, if it can house lowest-income households until their incomes rise.

Myth 5: There is no land for affordable housing.
Reality: Cities have land at appropriate locations that could be unlocked. Even in cities such as New York there are many parcels of under-utilized or idle land—including government-owned land—that could support successful housing development. Land can be freed for development trough idle-land regulations, land readjustment and pooling, and transit-oriented development.

Myth 6: Construction costs are too high to make housing more affordable.
Reality: Proven technologies and approaches and regulatory support can enable large-scale, low-cost housing production. Industrial approaches (using components manufactured off-site), standardization, and improved purchasing and other processes can reduce cost by 30 percent. Uniform building codes can spread these practices and government can use its purchasing power to build scale for industrial production, which can require high capital costs.

Myth 7: Affordable housing is too risky to finance.
Reality: Financing for purchasers and builders can be made less risky and less expensive. With better data (valid property appraisals, credit ratings, use of non-traditional credit-rating data) and proper controls, lenders can reduce underwriting costs and safely lower rates for low-income borrowers. Contractual savings programs can help borrowers build down payments. Developer financing costs can be cut in many ways, including de-risking projects by guaranteeing occupancy and streamlining permitting.

Myth 8: Affordable housing is an unattractive investment.
Reality: Well-located, properly maintained, affordable housing can be quite profitable. Housing built for lower-income households runs a higher risk of dilapidation and value loss, but mostly due to weak asset management practices and poor choice of location. However, if housing is built where residents can connect to employment and vital services, and if management realizes scale efficiencies in operations and maintenance, properties can rise in value.

Myth 9: Affordable housing is a national-level problem.
Reality: Yes, lack of access to decent housing is a national issue, but the solutions are local. Cities are the logical unit for housing planning: they can work best with the public, government agencies, and the local private sector. Only local planning using household-level data across all income bands and local decision-making can achieve community consensus and success.

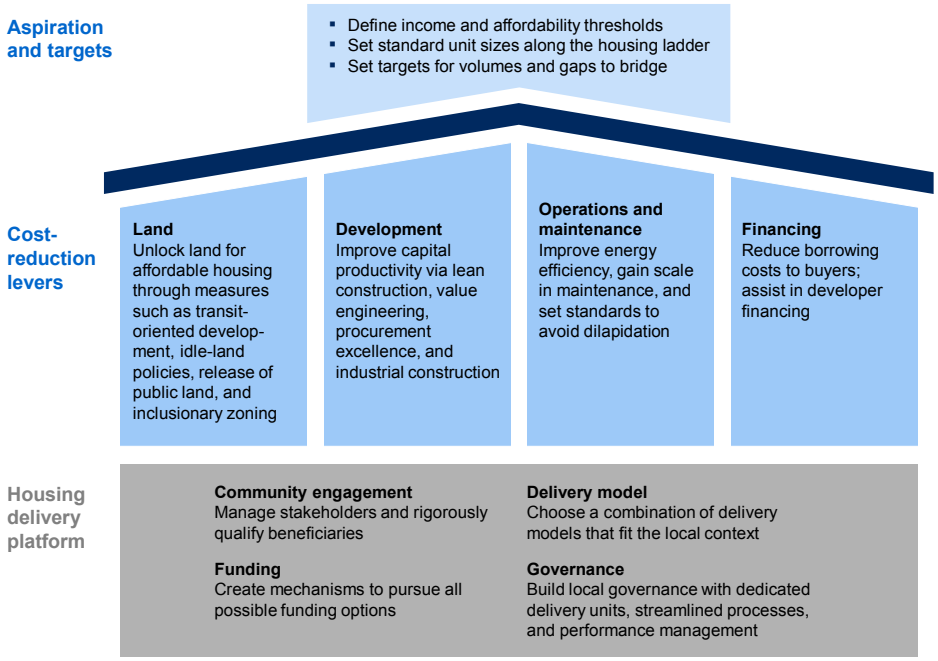
Myth 10: Affordable housing requires a massive commitment of government resources.
Reality: Speed of delivery may be the most important factor in success. If private developers can execute projects on tight, predictable schedules—and use cost-reducing strategies—the economics of affordable housing improve significantly. Cities must plan and oversee housing programs, but their greatest contribution might be ensuring that permitting and other development-related regulatory processes do not get in the way.

THE AFFORDABLE HOUSING GAP CAN BE NARROWED USING FOUR MAJOR APPROACHES

We identify four approaches that can narrow the affordable housing gap through savings in four areas: securing land for affordable housing at the right location, developing and building housing at lower cost, operating and maintaining properties more efficiently, and improving access to financing for home purchases, development, and rental assistance (Exhibit E2).

Exhibit E2

Affordable housing can be addressed systematically: setting targets, employing cost-reduction levers, and strengthening local delivery


Aspiration and targets
Define income and affordability thresholds
Set standard unit sizes along the housing ladder
Set targets for volumes and gaps to bridge
Cost-reduction levers
Land
Unlock land for affordable housing through measures such as transit-oriented develop-ment, idle-land policies, release of public land, and inclusionary zoning
Development
Improve capital productivity via lean construction, value engineering, procurement excellence, and industrial construction
Operations and maintenance
Improve energy efficiency, gain scale in maintenance, and set standards to avoid dilapidation
Financing
Reduce borrowing costs to buyers; assist in developer financing
Housing delivery platform
Community engagement
Manage stakeholders and rigorously qualify beneficiaries
Funding
Create mechanisms to pursue all possible funding options
Delivery model
Choose a combination of delivery models that fit the local context
Governance
Build local governance with dedicated delivery units, streamlined processes, and performance management

SOURCE: McKinsey Global Institute analysis

Based on a model of income distribution and housing costs for some 2,400 cities and an illustrative quantification of these approaches, we estimate that, if the four levers are used to their maximum potential, the housing affordability gap can be bridged entirely for segments of the population earning above 50 to 80 percent of median income (Exhibit E3). For households earning less, these levers will need to be complemented with additional measures and subsidies. This assistance can be used to provide appropriate standard housing units where possible or simply to improve living conditions. While we use a standard unit for entire cities to estimate the impact of our cost-saving levers, in reality cities should use a "ladder" of housing options that could include smaller units and communal housing for very low-income households, which can increase impact and broaden access to affordable housing.

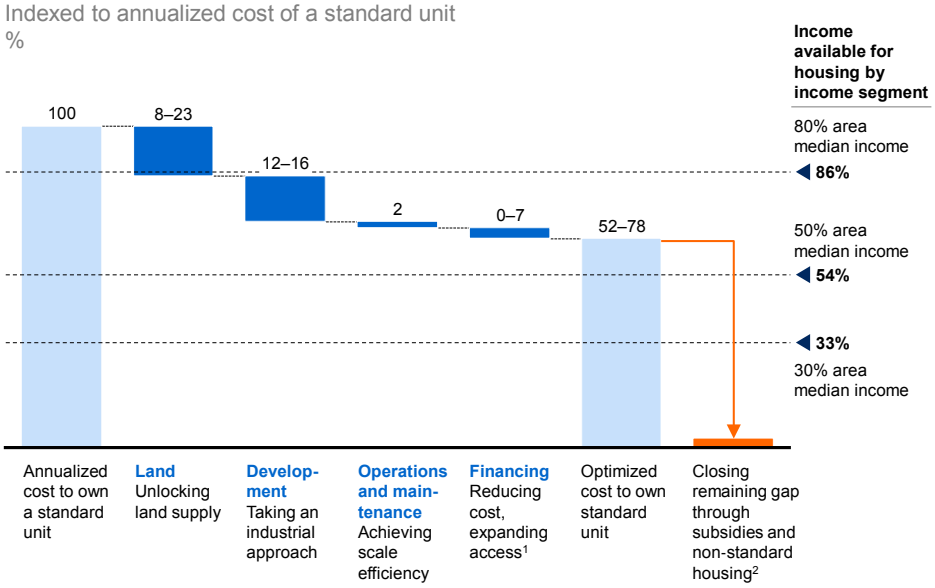
Exhibit E3

Four levers can narrow the affordability gap

Impact of levers on cost of standard unit

Indexed to annualized cost of a standard unit

%



1 Impact of reduced origination and funding costs is quantified; impact of increased access to financing is not.
2 Transitional use of basic housing (with communal toilets and kitchens, for example) to serve very low-income households.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

HOUSING PROGRAMS SHOULD BE BASED ON A BROAD VISION OF A HOUSING LADDER, WITH IMPROVING OUTCOMES

Housing programs should be designed to address needs across all income segments and account for changes that will occur in the circumstances of residents and in the economics and demographics of the city. So programs have to be comprehensive—covering both existing housing and new developments—and include both near-term and long-term objectives that reflect rising aspirations over time.

Too often, however, plans focus solely on how to create new housing units with minimum standards for every household. In the near term, this aspiration may be unrealistic, given budgetary constraints. Pursuing a too-ambitious near-term aspiration also can lead to common pitfalls. To fulfill minimum standards, affordable housing may be forced onto cheap land on the outskirts of the city, where residents are cut off from centers of employment and social connectivity. Another consequence could be more low-income residents crowding into substandard housing or informal settlements, since new housing meeting the minimum standards would be beyond their reach.

A better approach is to think about a ladder of housing aspirations, with rising standards for floor space per unit and amenities, which can be met over time. This requires cities to think about both the current stock of housing and the new flow of units and to consider the needs of each income segment. Cities would need to ensure the refurbishment of existing units and also invest in infrastructure and social services in informal settlements to improve conditions in the short term.

Cities can also aim to provide affordable rental options and transitional housing as part of the ladder. With this approach, cities can help the lowest-income citizens quickly move into safe, decent housing at locations with access to employment. At the same time that cities address the immediate needs of their poorest residents, they should work to improve the housing market for all income segments so that middle- and higher-income segments move into new supply, which releases their current homes for lower- income households. Such a ladder-based approach was used in Hong Kong to improve housing conditions for all lower-income segments.[2]

To craft near- and medium-term plans, cities need to use a rigorous analytical approach. This can start with a thorough assessment of the status quo, including household-level data on income, housing standards (land and floor-space utilization), and the distribution of housing occupied by different income groups across the urban land area, as well as locations of centers of employment and a precise inventory of existing housing stock and planned new supply, including prices.[3]

UNLOCKING LAND SUPPLY AT THE RIGHT LOCATION IS THE MOST CRITICAL STEP IN PROVIDING AFFORDABLE HOUSING

Finding land in an appropriate location is the most critical step in developing successful affordable housing. Indeed, if the decision about land is wrong, affordable housing projects cannot succeed, no matter how well construction, operations, and financing are managed. Projects must be built where residents can reach jobs in reasonable commuting times, families have access to schools and vital services, and people can connect with the society around them.

Land cost often is the single biggest factor in improving the economics of affordable housing development. It is not uncommon for land costs to exceed 40 percent of total property prices, and in some large cities, land can be as much as 80 percent of property cost. Where land is available at a lower price—on the fringes of the city—housing projects may fail due to lack of infrastructure (schools, hospitals, transportation to employment). We find that urban land markets do not respond well to normal supply and demand forces for several reasons, including fragmented or public ownership, poor land records, and regulations and zoning laws that discourage development.

2 Lok Sang Ho and Gary Wai-chung Wong, "The first step on the housing ladder: A natural experiment in Hong Kong," *Journal of Housing Economics*, volume 18, issue 1, March 2009.

3 Alain Bertaud, "Housing affordability in China: A stock and flow approach," presented at the Symposium on Low-income Housing in China, Beijing, July 10–11, 2009.

Six mechanisms have been used around the world to unlock urban land for affordable housing: developing new land around transportation infrastructure, releasing government-owned land for development, using regulatory measures (such as idle-land regulations) to unlock private land, assembling or readjusting land to allow development, formalizing ownership of informal land and modernizing land-registration systems, and reforming urban land rules to increase housing supply for all income segments (by changing density limits, for example). Regulatory reforms may involve "inclusionary" land-use rules to encourage development that includes affordable housing.

- **Smart, transit-oriented development.** Development around rapid-transit routes has several advantages, including improving labor mobility and, potentially, providing a mechanism for funding both affordable housing and transportation infrastructure. Access to rapid transit that can get residents to work within an hour is particularly important for low-income residents who often cannot afford a car. Over the past four decades, Hong Kong has added 1.4 million homes in the New Territories, across the harbor from Hong Kong Island, most of them oriented to transportation infrastructure: 43 percent of residents and 56 percent of jobs are within 500 meters of rail and metro stations. In cities where new transit facilities have been built, land values in the surrounding areas have risen by 30 to 60 percent. By capturing a share of that increase (through land sales or "betterment" assessments), government can pay for the infrastructure investment and the cost of affordable housing.

- **Releasing public land.** Governments often own significant shares of undeveloped land in cities, and this land is frequently valued below market prices.[4] In Turkey, the TOKİ housing agency has assembled 4,120 square kilometers, or 4 percent of urban land, largely by acquiring land from other government entities. This land is developed in partnership with private developers under a revenue-sharing scheme that allows TOKİ to split development costs and fund further land acquisition and development of affordable housing. China's government releases public land to the market every year, selling development rights and 70-year ground leases to developers. In Monterey, California, the city helped turn an old military base into a mixed-use development with an affordable housing component. Value captured from the release of public land is also a potential source of funding for infrastructure development.

- **Unlocking serviced idle land.** In many cities around the world, significant amounts of serviced residential land (with access to utilities and infrastructure) within urban areas are unused or under-developed. An analysis of a sample of parcels in Riyadh, Saudi Arabia, indicates that some 40 square kilometers that are zoned residential and have access to suitable infrastructure have remained idle for two decades. Land remains idle for a range of reasons, including lack of demand and hoarding for speculation as improvements and rising market values around the parcel result in an "unearned betterment" for owners. In some cases, a lack of clear title keeps land off the market. Tax and regulatory policy can unlock idle land through incentives (property tax exemptions for new development, for example) or penalties, such as idle-land taxes. To discourage hoarding, China charges the equivalent of 20 percent of land price to owners who leave urban property undeveloped for a year; after two years,

4 Alain Bertaud, *Converting land into affordable housing floor space*, World Bank policy research working paper number 6870, May 2014.

the land can be confiscated. In the Philippines, municipalities have the option of imposing an idle-land tax to unlock land for development.[5]

- **Enabling development through land assembly or readjustment.** Ownership of idle or underused land or dilapidated properties is often fragmented, making development of such land parcels complex and time-consuming. Land assembly and readjustment (also known as land pooling) have been used successfully in Japan, South Korea, and Gujarat, India. Under these schemes, owners pool their land in exchange for higher density and infrastructure investment. The readjusted land (typically a comparable or smaller plot with similar improvements) is then returned to the owners. The resulting increase in value creates a strong incentive for owners to contribute land for development.

- **Ensuring clear titles and formalizing informal land use.** Informal land can be formalized through legal structures that facilitate individual or collective ownership. Simply establishing who actually owns land can make it accessible to the market. Often in developing economies, land-registration systems have not evolved; upwards of 70 percent of land in developing economies is unregistered, according to UN-Habitat. An efficient land-registration system establishes clear ownership rights that enable transactions to move ahead without risk that another party will later assert ownership rights. In addition, a modern land-registration system provides a database of all parcels, their value, land-use restrictions, and any encumbrances (such as mortgages or easements) so buyers have certainty of ownership. Land registration and other legal processes to formalize ownership of informal land also can facilitate transfer of ownership to individuals or groups that have occupied the land.

- **Improving urban land-use rules and using inclusionary planning.** By changing land-use rules, cities can significantly lower the amount of land used per housing unit, usually by adjusting the permitted floor-area ratio. This can be done on a block-by-block basis to take into account the impact of higher density on infrastructure capacity. Developers then can construct more square meters of space for each square meter of land and can fill more demand for housing, particularly in areas close to transit stations where the infrastructure can support it. This practice has been used successfully in Seoul to expand housing supply in the South Korean capital. Encouraging development in this way can cause a trickle-down effect, in which new housing is created across all income segments and older stock becomes available at appropriate locations for low-income households. Broad reform to urban land regulation needs to be complemented in the near term by "inclusionary" planning that requires developers to supply affordable housing or land on which affordable housing can be built. Under inclusionary principles, in return for higher revenue per square meter of land (a density bonus), the developer must set aside a certain portion of a project for affordable units to be sold or rented to lower-income residents.

5 Richard F. Dye and Richard W. England, "The principles and promise of land value taxation," in *Land value taxation: Theory, evidence, and practice*, Richard F. Dye and Richard W. England, eds., Lincoln Institute of Land Policy, 2009.

This can provide land for affordable units at very low cost, even for free. In Barcelona's La Marina development, for example, increasing the floor-area ratio from 1.0 to 2.3 made it possible for the developer to offer half the units as affordable housing, with prices about a third of market rates. Many cities have also adopted transferrable development rights, allowing a private developer to fulfill its affordable housing requirement on another site. Inclusionary zoning must be carefully designed and managed to avoid unintended consequences, such as over-burdening infrastructure, allowing use of transferrable development rights to segregate low-income populations, or raising costs so much for higher-income households that demand for new development is suppressed.

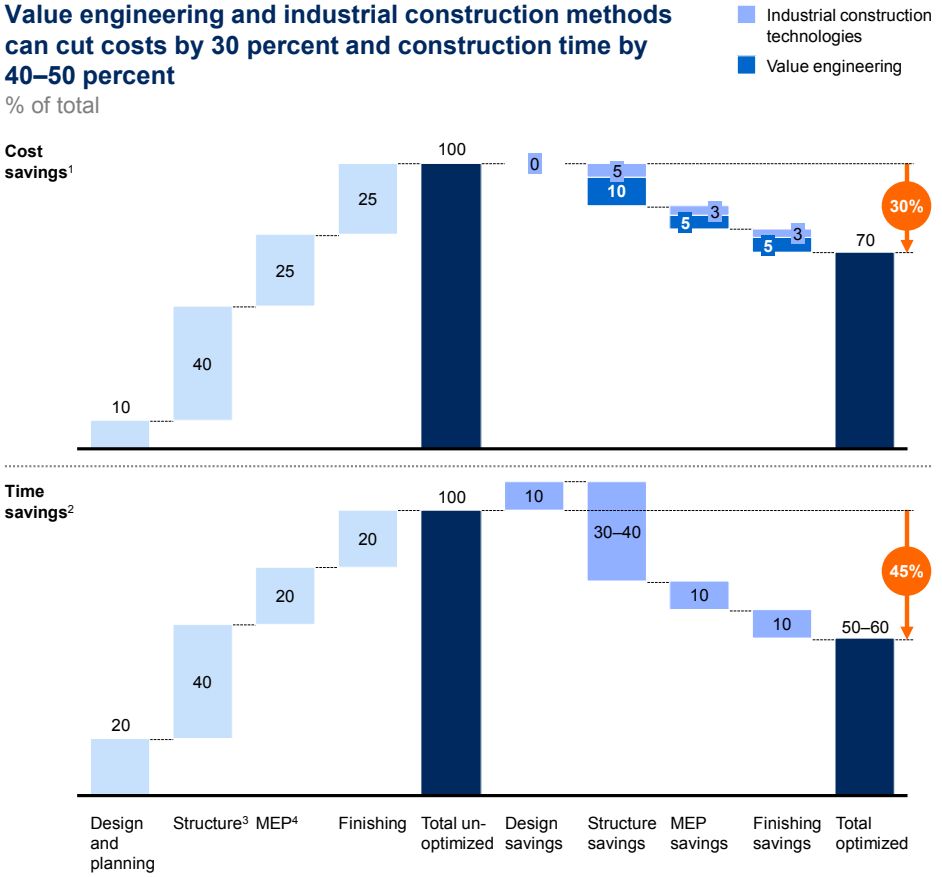
VALUE ENGINEERING AND INDUSTRIAL APPROACHES TO CONSTRUCTION CAN DELIVER HOUSING QUICKLY, INEXPENSIVELY, AND ON A LARGE SCALE

To meet rising demand for affordable housing—an estimated 2.4 million additional units will be needed annually by 2025 in the 20 largest cities alone—developers need to become more productive. In several affordable housing developments, value engineering to improve capital productivity and industrial construction techniques to improve labor productivity have helped to cut costs by 30 percent and shorten delivery time by 40 to 50 percent (Exhibit E4).

Exhibit E4

Value engineering and industrial construction methods can cut costs by 30 percent and construction time by 40–50 percent

% of total



1 Based on typical medium-density affordable housing development cost breakdown.
2 Based on 36-month baseline schedule.
3 Includes foundation, superstructure, and landscaping.
4 Mechanical, electrical, and plumbing.
NOTE: Numbers may not sum due to rounding.
SOURCE: Expert interviews; McKinsey Global Institute analysis

In most of the world, traditional approaches are still being used to build residential housing. And, instead of improving productivity with new approaches and tools, as other industries have done over the past two decades, the construction industry has seen productivity (of capital and labor) decline by 10 to 20 percent in many countries. Given prevailing land prices for parcels at suitable locations, we estimate that the housing industry would need to cut costs by about 30 percent to deliver a standard unit in a multifamily building that would meet affordability requirements. This implies a cost somewhere between $150 and $1,500 per square meter, depending on the country, which would require thorough application of capital productivity measures such as value engineering and efficient procurement, as well as adoption of industrial approaches such as use of prefabricated components. These potential savings are critical for making the economics of affordable housing attractive and encouraging developers to think beyond housing for mid- and high-income consumers.

- **Capital productivity and value engineering.** Capital productivity includes use of design-to-value techniques and standardization, efficient purchasing, and lean execution techniques, which together can reduce construction costs by 20 to 30 percent. Design-to-value means reducing unnecessary costs by, for example, "de-specifying" building requirements (reducing ceiling heights or specifying less expensive electrical or plumbing fixtures). A simple approach for builders is to standardize a few options for major systems, such as structural design and finishing elements, across their portfolios. Standardization simplifies training and, since workers repeat the same tasks with the same products, they become more productive. New information technology systems such as building information modeling software can help identify opportunities to save. If design-to-value approaches are adopted by developers, architects, and contractors together, savings of up to 15 percent can be achieved.

  Additional savings are possible through efficient procurement. By managing suppliers, standardizing parts to earn volume discounts and pushing suppliers to provide lower costs through technical innovation, developers can save up to 30 percent. The UK procurement efficiency initiative, which created buying consortia among owners of social housing (elsewhere known as public housing), helped save 15 to 30 percent on certain materials. For affordable housing, where margins are relatively thin, smart procurement can help builders withstand swings in commodity prices that might wipe out profits. Lean operations in construction—eliminating waste, streamlining critical-path processes, reducing buffer times between processes, and other approaches—can also reduce time and cost.

- **Industrial construction methods.** Industrial approaches save cost and time by moving critical construction processes off-site or using advanced on-site (*in situ*) techniques that make construction more like manufacturing. One of the most effective approaches is using prefabricated parts, such as pre-cast structural elements. The off-site manufacturing process improves quality and enables the developer to shrink schedules by having parts delivered as needed, rather than waiting for them to be fabricated on site. In South Africa, the cost of medium-density affordable housing projects was cut by 25 to 30 percent using industrial processes. In theory, 70 to 80 percent of activities for residential buildings could be completed off-site, but industrial approaches have been held back by large capital requirements, a need for scale

efficiencies, and the fragmented nature of many development and construction markets. An automated facility to produce enough cement slabs and walls for 12,500 housing units per year could cost about $30 million. To justify such an investment requires an assured level of demand within an economical delivery area. Advanced *in situ* techniques using tunnel forms and lightweight metal forms provide a less capital-intensive way to introduce manufacturing-like processes.

Government can play a key role in encouraging industrial construction through public procurement efforts, uniform building codes, and design standardization guidelines, which could encourage innovation in construction and building materials. Government can also help shape consumer acceptance—overcoming the stigma associated with industrial housing techniques that arose from their use in housing blocks in places such as the former Soviet Union and East Germany. Today's developers have found ways to overcome quality and aesthetic issues, for instance by varying facades and public spaces to give buildings distinct identities.

IMPROVED OPERATIONS AND MAINTENANCE MEASURES REDUCE OPERATING EXPENSES AND SUSTAIN ASSET VALUES

Once housing is constructed, additional cost savings can be achieved in operations and maintenance, which can account for up to 20 to 30 percent of annual housing expenditures, depending on the country. Reducing these costs can make housing more affordable, and establishing the right standards and governance can avoid dilapidation and help preserve housing stock.

There are two major ways to cut overall operations and maintenance costs by 10 to 15 percent: improving energy efficiency and reducing the costs to repair and maintain buildings through measures such as cooperative purchasing by social housing owners.

- **Improving energy efficiency.** In the United Kingdom and the United States, government programs have provided subsidies to enable low-income citizens to retrofit homes with energy-saving materials (insulation, windows, and efficient heating and air-conditioning systems). These retrofits have cut energy costs by 20 to 30 percent with a two-to-one return on investment.

- **Reducing maintenance costs and improving asset management.** Maintenance costs can be cut by finding scale economies. Typically, repair and maintenance service industries tend to be highly fragmented, and many operators are subscale and inefficient. By pooling demand for such services, these businesses can be encouraged to scale up and become more competitive. The UK social housing buying consortia, for example, achieved 25 percent savings across specific categories of operations and maintenance services. Scale improvements can also be encouraged by certifying and listing maintenance and repair services, giving purchasers a better basis for selecting vendors, and encouraging vendors to improve their services to attract more customers.

  Setting standards and empowering homeowner groups can greatly improve the quality of operations and maintenance activities. The UK Decent Homes Standard specifies minimum requirements for maintenance and provides incentives and funding to help social landlords make repairs. The government also encouraged a shift in ownership of social housing to private owners

(usually non-profits) and public-private partnerships to professionalize management, and provided grants for repairs. Under this program, the share of social housing meeting decency standards rose from 47 percent in 1996 to 85 percent in 2011. In Slovakia, homeowner associations were given broad new powers to operate and maintain former state-owned housing projects. Governments can encourage better asset management by setting guidelines for maintaining major systems and common areas and providing enforcement mechanisms for collection of maintenance and other fees.

IMPROVE FINANCING TO REDUCE COSTS FOR HOME BUYERS AND DEVELOPERS, WHILE SUPPORTING A HEALTHY RENTAL MARKET

How housing is financed has a significant impact on affordability. This applies both to home buyers and to developers. While access to finance for low-income households can be improved in advanced economies, it is a particular challenge in developing economies where financial systems are not as well developed and many low-income citizens are "unbanked" and work informally. As part of housing-finance policy, nations must also consider the role of renting in the housing mix (See Box E3, "Rental options are needed for low-income households as an alternative to ownership").

Box E3. Rental options are needed for low-income households as an alternative to ownership

There are many reasons that households would rather rent than own, including to maintain their flexibility to move to more attractive units when their incomes rise or to different places if they change jobs. Many households simply lack the income to accumulate a down payment, access credit, or keep up with monthly payments.

Governments typically provide a range of protections for renters, including minimum maintenance standards and regulations to ensure security of tenure. Restrictive rent price control schemes have often been introduced but have subsequently been phased out due to major challenges, including widespread abuse, limited mobility of renters, and depressed investment in rental properties. Less restrictive controls have been used successfully, particularly in Germany, where rent increases are limited to 20 percent over three years.

Some governments provide direct rental subsidies. The Netherlands, for example, offers direct financial assistance to all qualified renters; the United States has a voucher system. Hybrid approaches can complement rental markets. In shared ownership schemes, households can either build equity gradually through rent payments (a rent-to-own model), or they can own only the structure and lease the land (which is often owned by a land trust), thereby removing the cost of land from the unit purchase price.

Three ways to improve access to finance for low-income households

Access to financing for the purchase of housing by lower-income households is severely limited, particularly in places where the affordable housing gap is greatest. If they can get credit at all, lower-income households pay a premium because of their risk profiles. Many low-income households lack savings for substantial down payments, which means that they take out high loan-to-value mortgages, which are riskier and require higher interest rates. Furthermore, many low-income people are "unbanked" and lack standard records of income, savings, and payments that credit raters use.

We identify three ways in which to improve access to credit for low-income households to purchase affordable housing: reducing loan origination costs and underwriting risk, reducing the cost of funding mortgages, and leveraging collective savings such as provident funds to lower interest rates and increase down payments (Exhibit E5). All measures to develop housing finance markets require careful design to manage systemic risk. Also, for long-term financing schemes to work, it is important to have a stable macroeconomic environment that can contain inflation, which can be a challenge for developing economies.

Exhibit E5

Three main policy themes for improving access to home financing for buyers of affordable housing

		Relevant for countries with		
Themes	Tactics	Emerging primary markets	Strong primary markets[1]	Select country examples
Reduce loan origination costs	Improve assessment methods to qualify borrowers	●		▪ India ▪ South Africa
	Introduce standardized property valuation methods	●		▪ Poland ▪ Romania ▪ South Africa
	Initiate mortgage-guarantee schemes	●	●	▪ United States ▪ India
Reduce cost of funding mortgages	Establish liquidity facilities	●		▪ Colombia ▪ Malaysia ▪ Jordan
	Expand capital market funding (with covered mortgage bonds or mortgage-backed securities)	●	●	▪ Denmark ▪ Germany ▪ Spain
	Increase use of core deposits	●	●	▪ United Kingdom
Leverage collective savings to reduce rates	Launch housing provident fund	●		▪ Singapore ▪ Mexico
	Offer contractual savings schemes	●	●	▪ France ▪ Germany ▪ Kenya

1 In the primary mortgage market, lenders originate loans directly with borrowers.

SOURCE: McKinsey Global Institute analysis

- **Reducing loan origination costs and underwriting risk.** The most effective way to reduce origination costs is to reduce the risk of lending to lower-income buyers. Risks can be better assessed by establishing credit bureaus and certified property appraisal schemes—resources that are not present in many developing economies. Mortgage-guarantee programs can reduce the risk to lenders (and allow them to lend at lower rates) by protecting them in case of default. These guarantees are well-established in advanced economies but are not in place in many developing economies. Digital and online channels can increase access to banking services for low-income households and reduce the cost to serve them.

- **Reducing the cost of mortgage funding.** To increase funding for housing broadly, and therefore also for affordable housing loans, governments can encourage banks to make more loans backed by core deposits and find ways to connect mortgage lenders to the secondary financial markets. This can be done by creating liquidity facilities—intermediaries that match the long-term instruments of borrowers (mortgages) with the short-term goals of investors. For example, Malaysia's national mortgage corporation, Cagamas, helps fund mortgages by purchasing loans from banks and issuing debt securities to investors.

  Covered mortgage bonds, which have been used in Europe, provide a means of securitizing mortgage debt that reduces risk for investors by giving them a claim on the underlying assets, while also offering recourse to the bond issuer. Securitization of mortgages—with proper safeguards—remains an important means of providing liquidity and capital for home lending and can help developing economies fund mortgages for lower-income households. However, securitization requires sufficient evolution of financial institutions and markets, as well as tight oversight.

- **Leveraging collective savings.** Another way to reduce costs for borrowers is to use collective savings programs to build up savings to reduce mortgage size and to fund low-interest loans to program participants. Contractual savings programs create pooled savings by requiring members to make contributions. The savings build up at relatively low interest rates and are used to fund low-rate mortgages for members. Provident funds use mandatory savings such as pensions to fund housing loans, including for low-income households. Mexico's INFONAVIT is funded with a mandatory contribution of 5 percent of salaries from formal workers. It underwrites mortgages and is also involved in development of affordable housing.

De-risking, guaranteeing, or subsidizing developer financing can lower the cost of affordable housing

Developer financing—the equity and debt required to secure land and pay for construction until units are sold—typically makes up 5 to 10 percent of the total cost of housing developments. In some markets, all land purchases have to be funded with equity, which can be as much as 25 percent of project costs. Governments can reduce financing costs by reducing developer risk and capital cost. In Brazil, the housing authority commits to buying finished units or finding renters for them, reducing developer risk and financing cost. In the Cosmo City development in South Africa, the developer was not required to pay for the land until after the units were sold. Reducing permitting times and shortening development timelines can also cut developer capital costs. Governments can also provide more direct forms of financing assistance. The United Kingdom has a program to guarantee developer loans and improve debt terms and access. The most direct (and expensive) ways of improving financial terms for developers are subsidized interest rates (via tax-exempt bonds) or tax incentives, such as the Low Income Housing Tax Credit program in the United States.

Effective local housing delivery platforms are required to realize the potential savings in affordable housing

The steps we outline for cutting the costs of developing affordable housing cannot be fully effective without efficient local delivery platforms to manage and fund housing initiatives. The delivery platform is how the government turns its goals, aspirations, and policies into action. Before defining the platform, policy makers must be clear about specific targets and the levers to use to meet them, methods of funding, and the types of households that will qualify for subsidized housing. Cities should also determine the delivery and partnership models that will be used to create new housing, as well as the governance structures for affordable housing efforts. For affordable housing to be delivered in a timely and cost-effective manner, the process of getting approvals and permits will need to be streamlined in many places. To define a successful platform for the particular area, policy makers need to collaborate with the community, choose the housing delivery model(s) that fits the local context, identify all possible sources of funding, and establish rules for governance, including deciding how housing benefits will be allocated and managing the performance of housing-related regulatory processes.

DESIGN PROGRAMS WITH COMMUNITY INPUT AND ENSURE THAT BENEFITS REACH INTENDED RECIPIENTS

The most important decision in designing housing programs is to determine what targets and options will be pursued—defining the ladder of housing options—and the approaches and levers that will be used. These decisions must be made at the local level and with the participation of all relevant stakeholders. Not only should planners work with residents in areas targeted for housing efforts, but they also should engage nearby businesses, employers, and civic and social groups, to ensure that housing initiatives build better communities, as well as homes. At the start of any project, establishing precise goals will inform other decisions, including choice of delivery model. Outcomes should be specified, such as number of standard units to be delivered, percentage of cost-burdened families to be helped, and ratio of homeownership desired.

Cities must also have broad agreement on which income groups need assistance and how public investment in housing will be allocated equitably to targeted beneficiaries. The offer of below-market-rate housing invites abuse and cities need to create a reliable system to ensure that only those who meet the city's criteria get below-market housing. Rigorous screening is a first step. In South Africa, for example, applicants must have a verified national ID number, and screeners check the national housing subsidy database to ensure that applicants are first-time beneficiaries, a requirement for new housing. Turkey's TOKİ housing agency does not invest heavily in verification, but it imposes harsh penalties for fraud.

Allocation can be managed with waiting lists and lotteries or some combination. In Shanghai, waiting lists are created by randomly selecting names from batches of applications. Often disadvantaged groups—senior citizens, the disabled, the homeless, and families facing eviction due to demolition—jump to the top of the waiting list. In choice-based systems, tenants state their preferences and the government tries to accommodate requests. The choice of allocation system depends partly on resources: running a lottery is far simpler than maintaining lists.

CHOOSING THE COMBINATION OF DELIVERY MODELS THAT FIT THE LOCAL CONTEXT

To create affordable housing around the world, four major housing delivery models are used: consumer-led, incented private development, public-private partnerships, and public-sector delivery. The choice of delivery model depends very much on aspirations for the housing ladder and the capabilities and resources available.

- **Consumer-led delivery.** In this model, consumers hire builders to construct their homes, requiring individuals with little knowledge to navigate an opaque and fragmented construction industry. Yet this is a common way in which families obtain housing in many places. Government can improve the odds of success for consumers by providing benchmarking information and technical assistance—letting households know how much materials and labor should cost and providing advice on how to write and enforce contracts and manage timetables. Certification—by government agencies or trade associations—can help consumers make informed choices when selecting builders.

- **Incented private development.** In this model, private developers receive financial and non-financial incentives to build affordable housing, which is sold to consumers, purchased by the government for allocation to citizens, or operated as rental property. The government determines what incentives are appropriate and which land qualifies for such incentives. It also ensures that developers fulfill their commitments.

- **Public-private partnerships.** In public-private partnerships, the public sector is an active partner with the private developer, rather than a passive, regulatory actor. Private developers may be given public land to be developed. The finished units are sold directly to homeowners by the private developer or are allocated to buyers or renters by the government. The structure of the partnership is set up to allocate the risks along the affordable housing value chain to the most natural owner.

- **Public-sector delivery.** Development by a public-housing entity remains an important method for delivering affordable housing. Governments hire private-sector contractors to build on public land while retaining control and ownership of the project. The agency then sells or rents the properties.

CREATE MECHANISMS TO LEVERAGE ALL SOURCES OF FUNDING

Once the targets for the various rungs on the housing ladder are set, the city identifies the appropriate way to fund its housing programs. Governments rely on three broad approaches to fund affordable housing: capturing part of the increase in land and property values—from public investments in infrastructure or from changes in land use (allowing higher density, for example); through cross subsidies; and by using the public budget, including via tax breaks. Effective programs to deliver affordable housing take full advantage of all these opportunities.

Land-value capture is a popular form of cross subsidy that can be used to fund housing programs and other public needs. When cities rezone areas to allow more square feet of building on a parcel, they can offer a "density bonus" to developers: in return for the right to build more units—substantially raising the value of the property—developers provide the city with land for affordable housing or finished units. In this way, the city captures the value. As noted, land values also rise as a result of investments in infrastructure, such as new transit routes. That value can also be tapped—through betterment assessments, for example. From 1997 to 2007, Bogotá used betterment levies to finance more than $1 billion in municipal works. This mechanism can be applied to fund housing, too.

Governments also have used subsidies to reduce the cost of living for low-income households, in effect making their housing more affordable. Colombia discounts rates on electricity, gas, telephone, and water services by 15 to 50 percent for low-income citizens. Another form of subsidy is the low mortgage rates offered by provident funds, which are made possible by lower returns on savings and pension portfolios. Such subsidies must be applied with care since they can encourage waste and have other unwanted consequences.

Finally, public budgets are also used to fund affordable housing—directly or through tax incentives. In the United States, the federal government funds the Section 8 voucher program that helps lower-income households cover their rents. Another US program funded by general revenue provides grants to states for acquisition and construction of affordable housing. Many cities, particularly in the places where affordable housing is needed most, have limited access to tax revenue to apply to affordable housing. They can make the most of their limited funds by using them for viability-gap funding—providing the share of investment for affordable housing projects that makes the business case viable for the private sector.

ENHANCE GOVERNMENT PERFORMANCE AND STREAMLINE DELIVERY

How well the housing authority and other government agencies perform will have a defining effect on outcomes. Qualifying applicants for low-income housing and allocating these units equitably is an important step in delivery and a crucial responsibility—ensuring that households in need get help and protecting the public by preventing fraud. More importantly, by making all the regulatory steps as smooth as possible, government can save costs for developers and attract more private developers to the affordable housing sector. The effort to close the affordable housing gap is not just a matter of money; it is also a race against time. Delays in permitting and approvals affect the efficiency of the overall housing market, which inevitably has an impact on the availability of housing options for lower-income households. Furthermore, private developers that invest in affordable housing need to start receiving payments and cash flows as quickly as possible to maintain profitability; delays reduce returns and raise the cost of capital.

Government can help speed up the delivery of affordable housing by addressing bottlenecks caused by inefficient administration and permitting processes. There is a huge gap between countries that are efficient in these processes and those that are not; permitting time for the worst performers is five times that of the best performers.

To expedite approvals, government can reduce complexity by eliminating unnecessary steps or combining steps and centralizing authority. Another tactic is to identify which steps cause the greatest delays and are costliest to developers and focus on streamlining them. Automating the building approval process, like Singapore has done, can also significantly reduce permitting times. Ukraine cut its yearlong permitting times to three months by reducing the number of procedures and running those that remained in parallel. Colombia privatized permitting, hiring independent contractors and review consultants to process permits, with incentives to handle them expeditiously—as well as checks and balances to ensure that permits were properly vetted.

Cities can also improve the performance of their overall housing efforts by setting goals and tracking performance. Dedicated delivery units have proven effective in designing and operating a range of government programs and can be very useful in housing. Delivery units are relatively small, dedicated teams that can operate across government bureaucracies to move projects and programs ahead. Delivery units have been used in affordable housing programs in Singapore and the United Kingdom.

STANDARD APPROACHES WILL YIELD ONLY STANDARD RESULTS; THE AFFORDABLE HOUSING CHALLENGE DEMANDS NEW THINKING

Crafting and executing housing policy has been a challenge around the world. The four major levers and the delivery platforms described in this report can be used to reduce the cost of delivering housing and improve housing outcomes. These approaches can help citizens of all kinds find decent, affordable housing. However, they are only the tool kit. Meeting the growing housing challenge will require applying these tools in wholly new ways, with the broadest possible vision of what housing policy can do:

- **Set policy at the city level.** Clearly there are universal factors (and solutions) in the affordable housing challenge. But every city is a unique market, with its own land market characteristics, economic issues, demographics, housing stock, and regulations. Policy can succeed only if it is based on a detailed understanding of the city where it is to be implemented.

- **Funding follows function.** Too often a narrow view of the options to provide housing leads to the assumption that funding gaps—due to insufficient public resources—preclude action. Thinking more broadly about what can be done across the housing ladder can help cities identify other sources of funding.

- **Focus on location.** Nothing can overcome the problems caused by housing in the wrong location. There must be access to employment, education, and social resources.

- **Make employment and socioeconomic integration priorities.** Providing a clean, decent place to live can relieve suffering and improve health. Creating housing where residents can connect to employment and social services enables poor citizens to climb the socioeconomic ladder

- **Enable housing for all.** Housing policies that focus solely on building units to house the poorer segments of the population miss a larger opportunity. Making it more efficient to build and operate housing across the city can benefit all segments, including by making old stock available for different kinds of households.

- **Design an integrated approach.** To achieve significant results, cities need an integrated approach that coordinates policy and initiatives in multiple areas: land, development, operations, and finance.

- **Encourage efficiencies across the housing value chain.** The better the housing sector functions, the better the chances are that the city can close its affordable housing gap. Measures such as certifying builders and maintenance services can raise standards, increase transparency, and promote healthy competition.

- **Empower communities.** Ultimately, successful housing policy is about building and strengthening communities. Involving community members in critical decision processes and generating grassroots demand and support for housing initiatives can lead to better outcomes.

□ □ □

The challenge to provide decent, affordable housing confronts nations around the world. Despite efforts to address the affordable housing gap, it continues to grow and its effects are spreading, potentially causing greater harm to citizens and economies. In this research we have analyzed the record of affordable housing policies and we see a consensus emerging about what works and what does not. Initiatives succeed when they are based on solid data and a clear understanding of how a city's housing markets serve households of all kinds. Successful initiatives also treat housing as part of a broader effort to incorporate lower-income groups into the lives of cities and open a path for poor residents to raise their incomes. Starting with such a foundation and using the cost-saving approaches we describe in the following chapters in a systematic way, cities can make real progress in narrowing the affordable housing gap.

1. Affordable housing is a global challenge and opportunity

From London to Lagos, the increasing unaffordability of housing is a growing challenge to cities and nations. A rising share of residents—not just the poor—pay a disproportionate share of income for housing or live in inadequate housing that is cut off from places of employment and access to health and educational services. The United Nations Universal Declaration of Human Rights explicitly includes decent housing as a basic human right:

"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services..."[6]

The gap in decent affordable housing extends virtually around the globe, exacting a large social and economic toll on both developing and advanced economies, affecting both poor and middle-income citizens. The results are seen in the squalor of Brazil's *favelas*, the lack of sanitation in the slums of Mumbai, and the homelessness on the streets of Los Angeles. We estimate that globally about 330 million urban households live in substandard housing or are financially stretched by housing costs that exceed 30 percent of income. Among poorer citizens in high-cost cities, housing costs may consume as much as 70 percent of income. For example, in New York City, rents exceed 75 percent of income for nearly 20 percent of households.[7] If current trends persist, by 2025, about 440 million households, with approximately 1.6 billion people, could be living without decent affordable housing (Exhibit 1). In this chapter we describe the size and contours of the affordable housing challenge. In the next chapter we introduce a proposed framework for a solution.

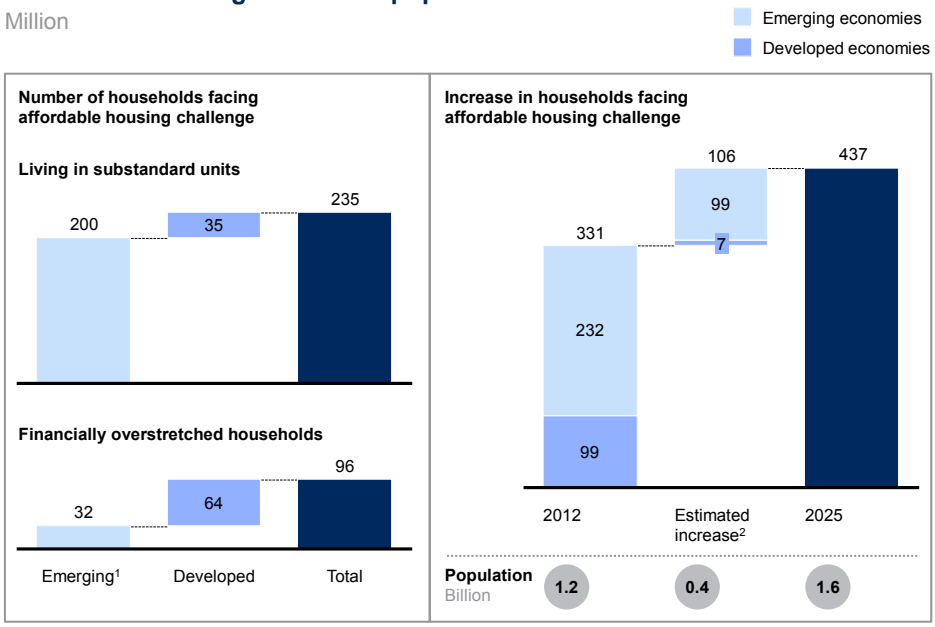
6 United Nations, Universal Declaration of Human Rights, Article 25, December 1948.

7 *Rents through the roof! A statistical analysis of unaffordable rents in New York City*, Office of the New York City Comptroller, September 2012.

Exhibit 1

By 2025, the affordable housing gap could affect 440 million households, or one-third of the global urban population

Million



1 Financially overstretched low-income households in emerging economies are defined as those living in standard housing but facing housing cost burden.
2 Estimated for over 2,400 cities by extrapolating 2012 property prices proportional to increase in median incomes.
NOTE: Numbers may not sum due to rounding.

SOURCE: Eurostat; HUD-PD&R Housing Affordability Data System microdata; Australia Census reports; Canada Census reports; Japan Census; Indian Ministry of Housing and Urban Poverty Alleviation; McKinsey Global Institute Cityscope database; McKinsey Insights China Consumer Survey 2012; China National Bureau of Statistics; Rosstat; Korean Ministry of Land; UN-Habitat; World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos, Exame; Notaires Paris Ile de France; Jones Lang LaSalle; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

HOW CITIES CAN DEFINE AFFORDABLE HOUSING IN THE LOCAL CONTEXT

We define "affordable housing" as dwellings that meet the economic requirements for affordability by low-income residents of a particular city. Here we use broad definitions and standards to create a global estimate of the affordable housing challenge. In general, affordable housing must be in habitable condition, include basic amenities, and allow access to the vital services that are required for a decent standard of living (schools, health-care facilities, transportation to employment). In this chapter we have applied commonly used standards for defining affordable housing along three parameters that guide housing policy (incomes, affordability, and minimum acceptable standards for housing). We use these standards for the purpose of sizing the global challenge and understanding the scale and dimensions of this problem. However, in every city these standards must be adjusted for the local context.

- **Low income.** For sizing purposes, we define low-income households as those that earn 80 percent or less of the median income in the area. We define households earning less than 50 percent of area median income as very low income and those with less than 30 percent of the median income or lower as extremely low income, in line with definitions used by the Department of Housing and Urban Development in the United States. While affordability challenges can affect all income groups, the definition of low-income groups can help focus policy interventions.

- **Affordable.** To be affordable, housing must not consume so much of the household budget that there is not enough left to pay for other essential items such as food or health care. Most often, an affordable cost of housing is defined as no more than a certain percentage of pre- or post-tax income. Typically 30 percent of income is regarded as a reasonable limit, and we use that in our calculations. The relevant percentage should be calculated based on actual data in each city. It should be noted that there are questions about the validity of income-based standards of affordability, since households may have other sources of income that do not show up in statistics (in-kind income or savings, for example) or may willingly allocate a high share of income to housing, due to family size or strong desire to live in a certain neighborhood.[8] Moreover, official definitions of affordability have varied significantly over time and between nations and can even vary within a region. In highly productive, high-cost cities, the households that command top salaries can spend 40 to 50 percent of income on housing and still have resources for all their other needs; in a low-income city, 30 percent might be a stretch, even for a median-income household.[9] Nevertheless, the 30 percent rule of thumb allows an insightful statistical description of the impact of housing costs in a city.

- **Decency standard.** A decent dwelling unit has a minimum floor-area (as determined by standards that are socially and politically acceptable) for each household member, includes basic amenities, adequate heating (if relevant), plumbing, and electrical systems, and is without damage or structural defects that can cause health or safety issues (such as broken windows, missing flooring, or holes, cracks, or leaks). Centers of employment must be within reasonable commuting distance via relevant modes of transportation for the income segment—usually a maximum of one hour away. School and health facilities also must be within short distance, which will vary according to location. UN-Habitat, whose mission is to promote sustainable settlements and adequate shelter, defines substandard housing as dwellings that do not meet any of five basic criteria: durability of structure, sufficient living space, access to safe water, access to sanitation, and security against eviction.

Countries and cities around the world have applied these parameters in different ways to guide housing policies. Brazil, for instance, uses multiples of its minimum wage to define income groups for purposes of gauging affordability, as does Spain. The European Union's Eurostat agency draws the line for affordability at 40 percent of post-tax income; in the United States, the common metric is 30 percent of pretax income.

The definition of a standard unit varies by country mostly because floor-area standards vary widely by income levels. In the United States, for instance, one room per person is typically applied as a threshold, and our review of affordable homes in New York City finds that a standard housing unit is about 90 square meters. In Japan, 40 square meters is considered the minimum for a three-person household. In the Indian state of Maharashtra, the housing authority defines minimum area between 28 and 45 square meters depending on household income.

8 Michael E. Stone, "What is housing affordability? The case for the residual income approach," *Housing Policy Debate*, volume 17, issue 1, 2006.

9 Edward L. Glaeser and Joseph Gyourko, "How do we know when housing is 'affordable'?" in *The affordable housing reader*, J. Rosie Tighe and Elizabeth J. Mueller, eds., Routledge, 2013.

While standards are important to set aspirations and analyze gaps, decision makers need to exercise great care when setting minimum standards as part of regulations. Once enshrined in regulations, they dictate standards and costs (and affordability) of any new housing that is built. Standards that are too high may be inappropriate and raise costs beyond the reach of low-income families. In low-income countries, households can find financial overstretch more stressful than living in crowded quarters, and too-high standards may push them into informal dwellings. Therefore, it is helpful to set standards in the context of a city's income distribution, with a range of requirements that will include decent accommodations that can be built affordably for even the poorest segments.

THE CHALLENGE: BY 2025, AT LEAST 1.6 BILLION PEOPLE COULD BE IN NEED OF AFFORDABLE HOUSING

Based on current trends in migration to cities and likely incomes of new residents, we estimate that by 2025, the number of households around the world that are affected by the affordable housing challenges could reach about 440 million. In 2012, we estimate that 330 million urban households globally lived in substandard housing or were economically stretched. This represents about 1.2 billion individuals. An estimated 130 million new urban households earning less than 80 percent of the area median income are likely to be created by 2025. Out of these new low-income households, about 106 million will not be able to afford market-rate housing, based on the basic unit size standards used in their areas. Based on current projections of shifts in household composition, we estimate that this represents about 400 million people.

Combined, these trends indicate that at least 1.6 billion people around the world could be in crowded, inadequate, and unsafe housing or financially stretched by their housing payments. To put this in perspective, the United Nations estimates that the urban population in 2025 will reach 4.6 billion globally, which means that at least a third of city dwellers would face a housing challenge. As urbanization continues, we estimate that the number of people affected could rise to at least 1.7 billion in 2030 and 1.8 billion in 2035.

This estimate is based on an affordability threshold defined as what households earning 80 percent or less of area median income would pay to obtain housing that meets locally relevant basic standards at market prices using 30 percent of income. It is based on data from 2,400 cities; the number of households with affordability challenges would be higher if all urban centers and households of all income segments were included. According to UN-Habitat's projections, for example, the number of slum dwellers could rise to two billion by 2030, from an estimated one billion today, if no significant efforts to rehabilitate slums are undertaken.[10]

Affordable housing gaps are most severe in developing economies, but unaffordable and substandard housing are significant problems in advanced economies, too. According to Eurostat, about 11 million EU households, or about 5 percent, experience severe housing deprivation, which is defined as living in overcrowded or substandard housing conditions. Among the poorest 20 percent of EU households, the rate experiencing severe housing deprivation is more than twice as high, about 12 percent. In Japan, about four million renters live in units that do not meet acceptable housing standards. In the United States,

10 UN-Habitat, *The challenge of slums: Global report on human settlements 2003*, United Nations Human Settlements Programme, 2003.

two million households (about 2 percent) live in inadequate housing, and an estimated 600,000 individuals are homeless.[11] In the United States, the European Union, Japan, and Australia, more than 60 million households are financially overstretched, unable to pay for essential goods and services beyond housing because so much income is devoted to rent or mortgage costs. They underspend on food and clothing as well as health care and insurance coverage.

The magnitude of the affordable housing challenge in advanced economies, however, is dwarfed by that of developing economies. Today, the fastest urban population growth is occurring in developing economies, and the number of low-income households is rising rapidly. Four of the top five cities in terms of low-income household growth by 2025 will be in China; Shanghai could add 2.3 million low-income households, and Beijing could add 2.5 million. Lagos is on track to add 1.3 million low-income households, a majority of which would not be able to afford housing at market rates. Most of these new low-income households will likely make their homes in sprawling slums with poor and unsafe living conditions.

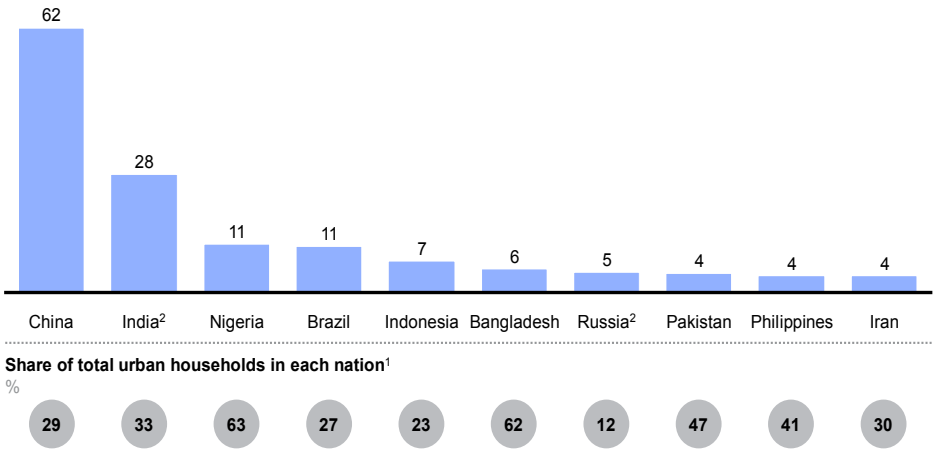
In total, an estimated 200 million urban households in Asia, Africa, and Latin America are ill-housed and live in slums. China (62 million), India (28 million), and Nigeria and Brazil (11 million each) have the largest numbers of households living in substandard housing. Since India is still mostly rural, a larger number of substandard housing would be found in rural areas. Roughly 60 percent of substandard housing is concentrated in ten countries (Exhibit 2). Financial stretch is an issue, too—with about 30 million urban low-income households in emerging economies feeling the pinch from housing costs. In China, we estimate, about 14 million low-income households are financially overstretched through rent or mortgage payments.

Exhibit 2

About 60 percent of substandard housing is concentrated in 10 nations

Substandard housing units in urban areas[1]

Million



1 Based on 2009 data (latest available).
2 Based on 2012 data.

SOURCE: United Nations Millennium Development Goal Indicators; Census India; Rosstat; McKinsey Global Institute analysis

11 *American housing survey 2009*, US Census Bureau and US Department of Housing and Urban Development.

THE GLOBAL AFFORDABILITY GAP IS ABOUT $650 BILLION PER YEAR

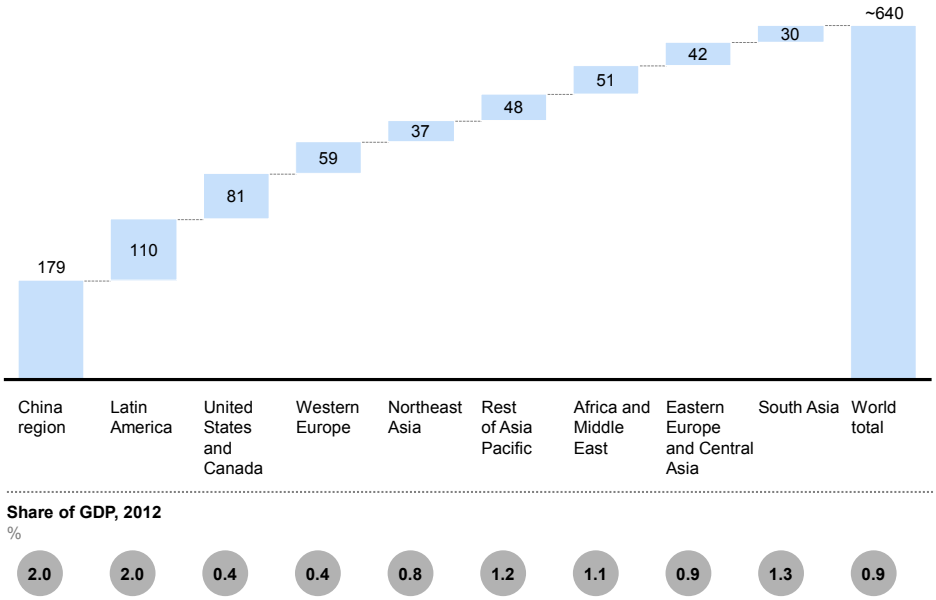
We estimate that the economic affordability gap is $650 billion globally today. This figure—the difference between the annualized current market price of a basic standard unit (defined specific to each geography) and what households earning 80 percent or less of the median income in the area should pay for housing—corresponds to about 1 percent of global GDP (Exhibit 3).

Exhibit 3

The cost of the global affordable housing gap is about $650 billion, or about 1 percent of global GDP

Affordability gap by region, 2012[1]

$ billion



Share of GDP, 2012

%

1 Cost of bridging the gap is the amount of money needed to bring the annual income available for housing of all the low-income households to the market annualized cost of a standard unit. Assumptions: mortgage rates by country where available otherwise regional averages assumed, 30-year tenure of mortgage with 20% down payment.

SOURCE: World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos; Exame; Notaires Paris Ile de France; Jones Lang LaSalle; McKinsey Global Institute Cityscope database; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

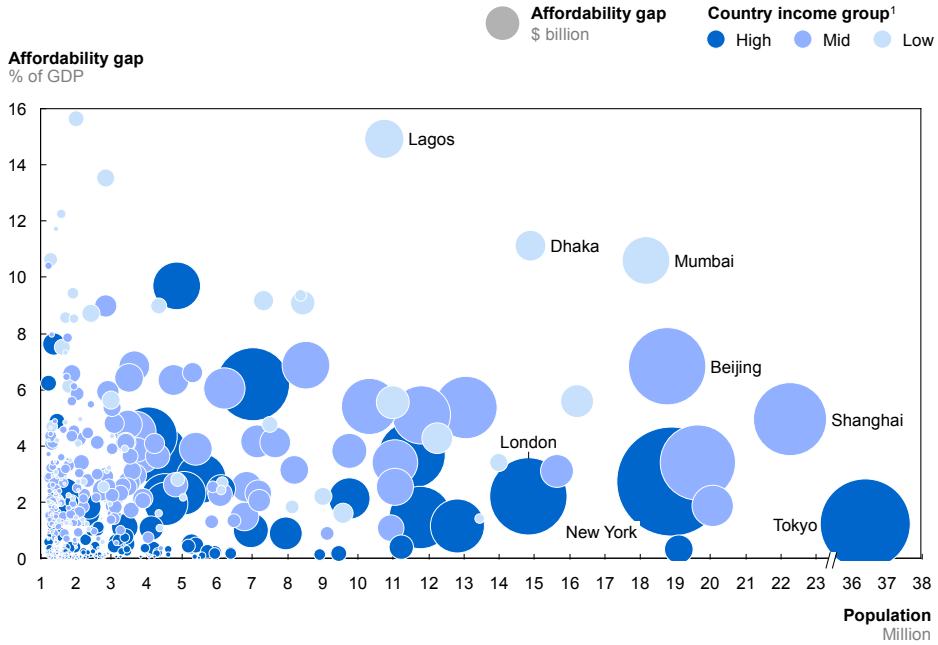
The affordability gap includes the financial overstretch faced by households that pay more than 30 percent of income for a standard housing unit, plus the money spent on existing affordability programs (such as rent vouchers), and the implied annualized cost of upgrading substandard units to standard status. The sums involved underscore the scale of this problem and why it is too large to solve through direct subsidies and government interventions alone. For more detail on how we calculate the affordability gap, see Appendix A.

To understand the global challenge in terms of this economic cost, we analyzed market prices of standard units and the local capacity to pay for housing in 2,400 cities (Exhibit 4). According to our analysis, about 320 million households globally cannot afford locally relevant standard housing units at current market prices. This is in line with our bottom-up estimation of 330 million households that are currently overstretched or living in substandard housing. In some 240 cities with populations of more than two million, low-income households earning less than 80 percent of local median income are not able to afford a standard unit at market prices (Exhibit 5). In fact, in about 40 percent of cities with population

exceeding two million, even median-income households cannot afford housing at market rates. In some extreme cases, such as Dhaka, Bangladesh, and Lagos, more than 90 percent of households are unable to afford standard housing units at market rates. In such cities households are forced into informal—and substandard—housing.

Exhibit 4

We have sized the affordability gap for approximately 2,400 cities



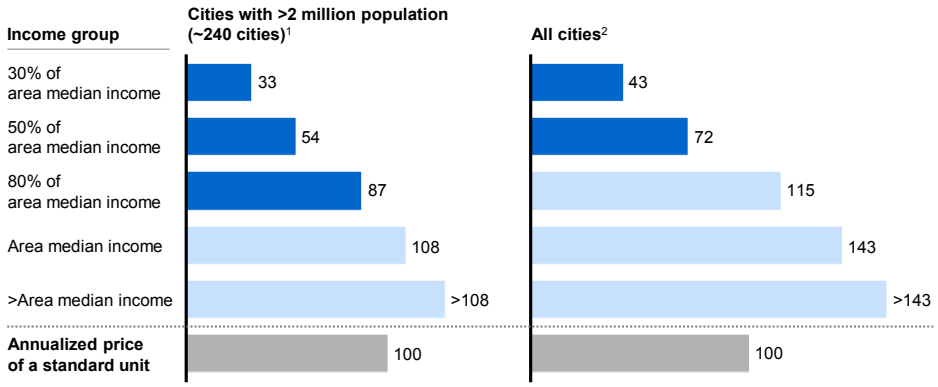
1 As defined by World Bank.

SOURCE: World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos; Exame; Notaires Paris Ile de France; Jones Lang LaSalle; McKinsey Global Institute Cityscope database; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

Exhibit 5

How affordability affects different income groups across cities

Annual income available for housing indexed to annualized market price of standard unit, by income group
%



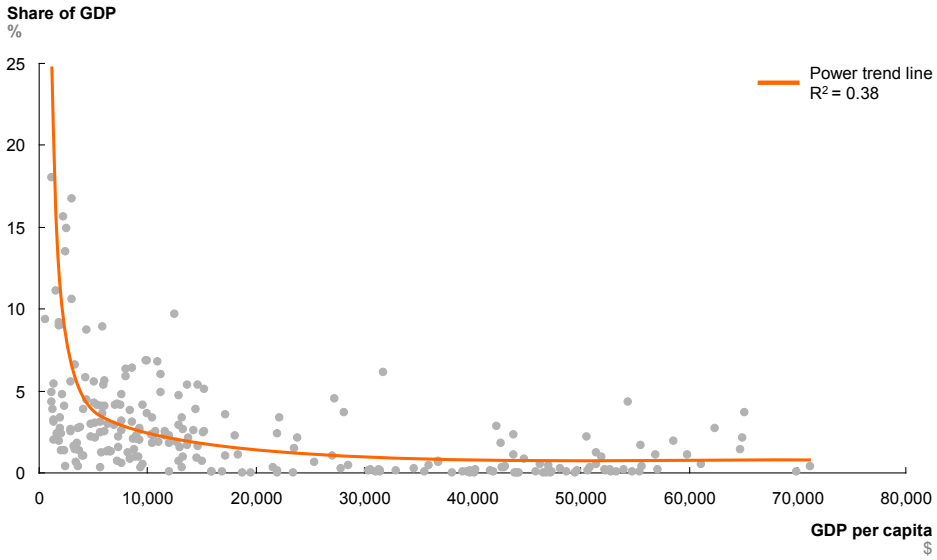
1 Population in 2010.
2 Over 2,400 cities.

SOURCE: World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos; Exame; Notaires Paris Ile de France; Jones Lang LaSalle; McKinsey Global Institute Cityscope database; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

The economic affordability gap is concentrated in megacities, led by New York ($33 billion), Tokyo ($23 billion), and Beijing ($17 billion). The ten cities with the largest affordability gaps account for 27 percent of the global gap, and the top 100 cities account for 70 percent. The affordability gap as a share of GDP is twice the world average in China and Latin America. This can be attributed to real estate booms in these regions, which have driven up prices. Western Europe, North America, and other more developed regions face a lower, but still relevant, economic affordability gap from housing relative to GDP. Several low-income megacities such as Mumbai and Lagos have an affordability gap of more than 10 percent of local GDP. The affordability gap relative to the GDP is highest for low-income economies but remains above 1 percent even for several high-income economies (Exhibit 6).

Exhibit 6

The affordability gap represents a higher share of GDP in low-income cities



SOURCE: World Bank; UBS Prices and Earnings Report 2012; Numbeo; CEIC; Deposits.org; Global Banking Pool; Royal Bank of Scotland; Zillow; Metroscubicos; Exame; Notaires Paris Ile de France; Jones Lang LaSalle; McKinsey Global Institute Cityscope database; US Census Bureau; national statistics offices; McKinsey Global Institute analysis

These estimates do not take into account certain factors for which reliable data are unavailable. For example, the estimate could overstate the gap for existing households since they might occupy high-quality housing that they inherited or purchased when market conditions were more favorable and for which they are not paying current prevailing costs. This estimate differs from other affordability indices because we measure the affordability gap for standard units for low-income households, while other affordability measures look at median or average home prices in a region compared with median incomes.

DEVELOPING AFFORDABLE HOUSING IS AN INVESTMENT OPPORTUNITY—AND CHALLENGE

The prospect of trying to fill a gap of 440 million housing units may seem daunting to policy makers, but it could represent a massive opportunity for the private sector. The investment associated with building the housing needed to close this gap would be $9 trillion to $11 trillion for construction alone.[12] With the cost of land, we estimate the total could be as much as $16 trillion.

This investment entails building affordable housing units to replace existing substandard units as well as new housing for the additional low-income urban households that would be added from 2012 to 2025. To build homes for all the low-income households that will be added in cities by 2025 could cost $2.3 trillion, representing a construction market of $200 billion to $250 billion annually, or about 10 percent of the global residential real estate construction industry. Based on the measures to reduce the cost of delivering affordable housing that we describe in this paper, and our affordability gap model, we estimate that the share of this investment that would need to come from public sources—the "viability gap"—would be $1 trillion to $3 trillion. However, the share of viability gap funding required will vary significantly across cities.

There could be additional benefits for the global construction sector. Changes in land-use regulations and incentives that are intended to spur private development of affordable housing might spark additional demand for construction. There may also be significant opportunities in rehabilitation and renovation as well as in new construction, as existing housing stock passes from middle-income to lower-income segments. Thus, our estimate of the opportunity for the construction industry may be on the low side.

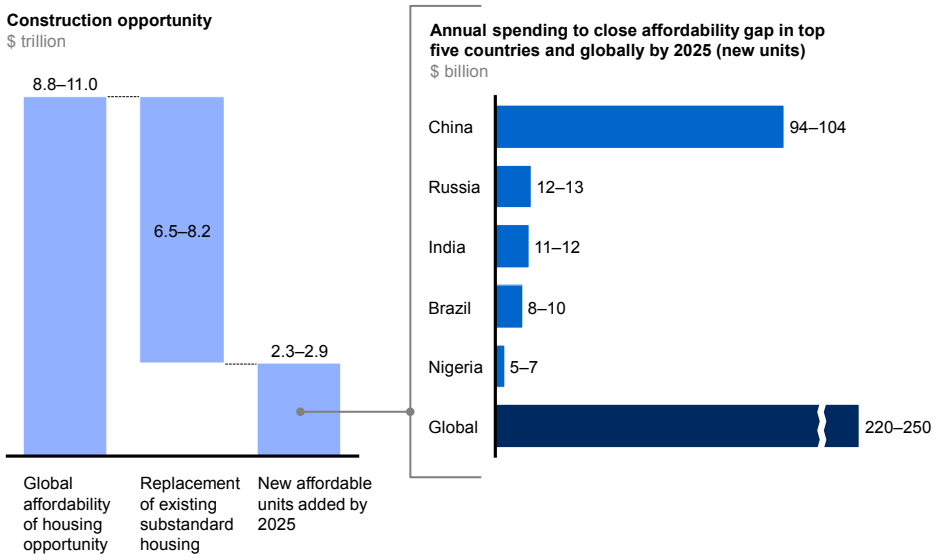
About 75 percent of the construction opportunity would be replacement of substandard housing, mostly in developing economies. The largest construction opportunities in affordable housing for new units to match the increase in low-income households by 2025 would be in China, Russia, India, Brazil, and Nigeria (Exhibit 7).

Providing financing for new low-income households to purchase homes would require mortgage underwriting of $300 billion to $400 billion per year, or about 7 percent of the global new mortgage origination volume. China, India, Russia, Brazil, and Nigeria represent the largest markets for new build because of the large increase in new low-income households by 2025.

12 The upper bound of our estimate is based on current construction cost estimates; the lower bound represents estimates of affordable housing construction costs that have been optimized by use of industrial construction techniques and other measures described in Chapter 2.

Exhibit 7

Building affordable housing could be a $9 trillion–11 trillion global construction opportunity



1 Represents only additional low-income households entering cities by 2025 that will face affordability challenges.
NOTE: Numbers may not sum due to rounding.
SOURCE: Turner and Townsend; Gardiner and Theobald 2011; AECOM; Eurostat; UN Stats; McKinsey Global Institute Cityscope database; US Department of Housing and Urban Development; Global Construction 2025 report; Mexico Chamber of Commerce; McKinsey Global Institute analysis

MARKET INEFFICIENCIES AND NEGATIVE SOCIAL EFFECTS FROM HOUSING CAN BE ADDRESSED

Affordable housing is a challenge that has frustrated city and national governments for decades. Despite genuine success stories, the problem continues to outrun solutions in most places. The urbanization process that is sweeping through developing economies will only raise the stakes; as the number of people who lack affordable housing grows, so will the negative effects on economies and societies—and the risks of not adequately addressing the problem.

An enormous force holding back meaningful progress in affordable housing is a series of market inefficiencies that unnecessarily raise the cost of delivering affordable housing. These failures range from land markets that do not respond in expected ways to changes in pricing and demand to construction industries in many nations that have not been compelled to by competition to adopt more productive methods. These market failures can be addressed and, in some places, they have been. But they have not been tackled in a systematic way in support of affordable housing.

Addressing negative spillover effects from lack of access to affordable housing

As the affordable housing gap grows, so do the social costs—on people, cities, and entire economies. People in unaffordable or substandard housing are more often victims of crimes, suffer more health problems, and fail to integrate into society. Adults who live in substandard housing have higher rates of unemployment and are more likely to be employed in marginal, informal businesses at very low pay. Compared with working families that pay 50 percent of income for housing, those paying 30 percent or less spend twice as much of their income on health care and insurance.[13]

Children in substandard housing are less likely to attend school or continue long enough to qualify for formal employment (see Box 1, "The human face of the housing challenge"). One study found that growing up in overcrowded housing reduced the high school completion rate by 11 percentage points for boys and by six percentage points for girls.[14] Living in substandard housing also raises risks to physical and psychological health of children. Studies show that children who are homeless experience rates of mental health problems and developmental delay that far exceed the averages and even exceed those among other poor children.[15]

When households are forced to spend a disproportionate amount of income on housing, they must cut back on other essential expenses. Children in low-income families that do not have subsidies to make housing more affordable are twice as likely to have extremely low weight for their ages as children in families receiving subsidies.[16]

Conversely, investment in affordable housing can help mitigate a range of social problems (Exhibit 8). Most importantly, having a decent place to live gives individuals and families more than shelter and security. It gives them an identity and is the first step toward inclusion and in many places, toward integration into society and the formal economy; it puts people on the path to upward mobility.

A lack of adequate affordable housing also can have broad economic effects. Construction and operation of affordable housing create jobs in similar numbers to those associated with market-rate housing. The National Association of Home Builders estimates that for every 100 affordable apartment units built in the United States, 120 local jobs are created during the construction phase and about 30 jobs are created after completion.[17]

13 Barbara Lipman., "Something's gotta give: Working families and the cost of housing," *New Century Housing*, volume 5, issue 2, Center for Housing Policy, April 2005.

14 "Housing and schooling," *The Urban Prospect*, volume 7, number 2, March–April, 2001.

15 Julie M. Passeio Rabideau and Paul A. Toro, "Social and environmental predictors of adjustment in homeless children," *Journal of Prevention & Intervention in the Community*, volume 15, number 2, 1997.

16 Alan Meyers et al., "Subsidized housing and children's nutritional status: Data from a multisite surveillance study," *Archives of Pediatrics and Adolescent Medicine*, volume 159, number 6, June 2005.

17 National Association of Home Builders, *The local impact of home building in a typical metro area: Income, jobs, and taxes generated*, June 2009.

Box 1. The human face of the housing challenge

The human costs of the affordable housing gap, whether in the developed or developing world, reach far deeper than a question of economics. In 2013, *The New York Times* detailed the realities of homelessness in an eye-opening four-part report. In New York City, more than 130,000 families are on waiting lists for public housing, and more than 50,000 people (including more than 20,000 children) are housed in homeless shelters.[1] The *Times* told the story of an 11-year-old girl named Dasani as her family coped with daily life in a city-run homeless shelter in Fort Greene, Brooklyn.

For three years, Dasani, her parents, seven siblings, and all their possessions crammed into a single room at the shelter. There they dealt with rodent infestations, dank and filthy communal bathrooms, and dingy living conditions. While they were there, women were sexually assaulted, and an infant died from respiratory illness, prompting officials to declare the shelter unsafe for children under two or those who suffer from asthma. Two of those children are Dasani's siblings, and her mother also contracted tuberculosis as teenager in another shelter.

Across the globe in Mumbai, *The Express Tribune* told the story of 11-year-old Salma's family. Salma, her parents, and four siblings live in Dharavi, one of the largest slums in Asia, occupying a one-room, 11-square-meter house and sharing a single coir mat to sleep on. There is one toilet—a five-minute walk from the house—that is shared by the neighborhood. It is often broken and unavailable.[2] Their community floods regularly, damaging the few possessions they have. Salma's family is not unusual—a recent census in India found that one in six urban residents lives in conditions that are "unfit for human habitation."[3]

Decent housing opportunities can change the outcomes for such families. The story of Dasani's family ends when they move into a city-owned apartment. For families like Salma's the journey may take longer, but in Mumbai, slum rehabilitation efforts are beginning to gain traction. High-rise buildings for mid- and high-income households are being built on slum land, with free housing supplied for former slum dwellers.[4]

1 Andrea Elliott, "Invisible child: Girl in the shadows—Dasani's homeless life," *The New York Times*, December 9, 2013.

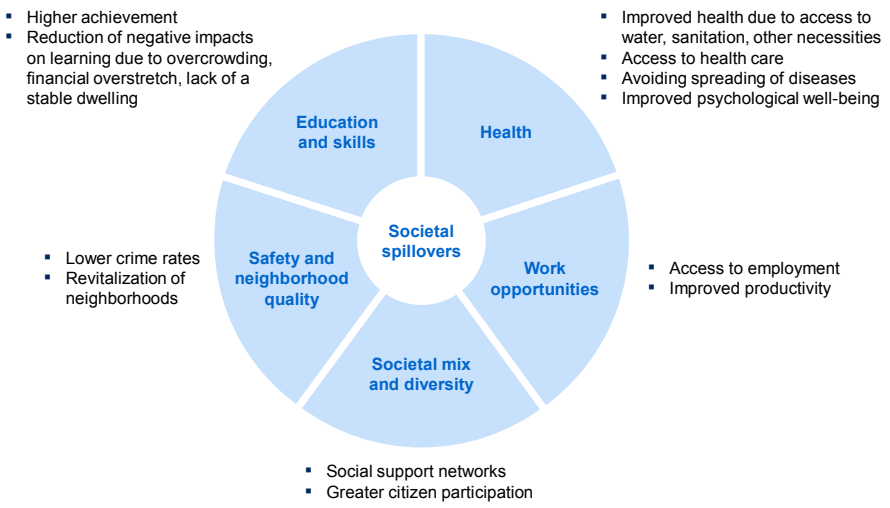
2 Raksha Kumar, "Bombay slums: Dark, dingy, and full of hope," *The Express Tribune*, May 4, 2012.

3 Kay Johnson, "India slums: 1 in 6 Indian city dwellers live in conditions 'unfit for human habitation,'" Associated Press, March 22, 2013.

4 Bhuma Shrivastava and Sheridan Prasso, "In India, slum dwellers move into high rises," *Bloomberg Businessweek*, August 28, 2014.

Exhibit 8

Access to quality housing leads to societal benefits including better health and safety, work opportunities, and diversity


Higher achievement
Reduction of negative impacts on learning due to overcrowding, financial overstretch, lack of a stable dwelling
Education and skills
Improved health due to access to water, sanitation, other necessities
Access to health care
Avoiding spreading of diseases
Improved psychological well-being
Health
Societal spillovers
Lower crime rates
Revitalization of neighborhoods
Safety and neighborhood quality
Work opportunities
Access to employment
Improved productivity
Societal mix and diversity
Social support networks
Greater citizen participation

SOURCE: McKinsey Global Institute analysis

At the same time, falling affordability can be a drag on the local economy. An increase in the ratio of housing prices to income can slow the rate of employment growth and, according to the Federal Reserve Bank of Boston, in a city where the median home price is three times the median household income, employment growth would be 2 percentage points lower over two years than a city in which the median price is only two times the median income.[18]

Addressing market inefficiencies

Often, affordable housing gaps and frustrated efforts to narrow them can be traced to market inefficiencies. Inefficiencies caused by market structure or regulatory issues can thwart efforts to secure land for development and raise costs for developers, owners, residents, and municipalities. All these inefficiencies limit the supply of affordable housing at a time when demand is growing. However, for each of these forms of market inefficiency, potential solutions exist.

Inefficiencies in urban land markets are an enormous barrier to closing the affordable housing gap. Acquiring land on which to build new housing at appropriate locations is costly and complex, largely due to regulatory issues. Land-use and zoning restrictions limit where projects can be built and often raise the cost of land in the most appropriate locations for affordable housing. Cities may seek to limit development to avoid over-burdening infrastructure (or to avoid the expense of adding infrastructure) or to preserve open space.[19] Property owners and residents may push for limits on growth to preserve property values and quality of life and to avoid congestion.[20] This creates a perverse feedback loop, in which households occupy more land than they require and the lowest-income segments get crowded into informal markets.

Even in the face of enormous demand for new housing, land in appropriate locations remains vacant because it belongs to the government or ownership is fragmented—with many parcels in the hands of many private owners. In developing economies, with poor land records, it may be impossible to determine who the owner is. And, appropriate land may be unavailable due to speculative hoarding.

Market inefficiencies are also seen in the construction and building operations businesses. In many nations, the construction industry is highly fragmented with many small players. Moreover, the industry overall has not adopted new techniques and technologies sufficiently to raise productivity and reduce costs. Building operation and maintenance are major components of housing cost, but that market is extremely opaque and owners often have little knowledge about what they should be paying or how they could save.

18 Ritashree Chakrabarti and Junfu Zhang, *Unaffordable housing and local employment growth*, New England Public Policy Center at the Federal Reserve Bank of Boston working paper number 10–3, 2010.

19 For an overview, see Christopher T. Boyko and Rachel Cooper, "Clarifying and re-conceptualizing density," *Progress in Planning*, volume 76, 2011.

20 Rolf Pendall, Robert Puentes, and Jonathan Martin, *From traditional to reformed: A review of the land use regulations in the nation's 50 largest metropolitan areas*, Brookings Institution, August 2006.

Finally, the process of financing affordable housing—both purchases by residents and financing construction by developers—could be smoother and less costly. Low-income buyers have limited access to credit. And when they can obtain mortgages, they may pay higher rates than other borrowers. Developers face a range of risks, such as slow permitting processes that cause delays and indirectly raise their capital costs.

In Chapter 2 we describe four approaches to narrowing the affordable housing gap that directly address these market inefficiencies. These include strategies for freeing up urban land in appropriate locations, reducing construction costs, finding scale efficiencies in operations and maintenance, and making financing less expensive and more available. In addition to interventions to improve the operations of markets (such as licensing and registering maintenance firms to increase competition), these approaches include both cross-subsidies (such as density bonuses for developers to fund affordable housing) and outright subsidies (such as housing vouchers or developer tax incentives). The latter two mechanisms can be contested from a pure economics standpoint but will be required, at least in the near term, to reduce the housing gap and house low-income citizens in places where they can form communities, find work, raise families safely, and enjoy greater opportunity.

□ □ □

The challenge to provide affordable housing extends around the world and affects people across income groups. The challenge is large and growing and, left unaddressed, will likely have increasingly harmful effects on both the lives of citizens and the vitality of economies. What could make efforts to close the affordable housing gap more successful now is the greater understanding—and consensus—about how it can be done. The experiences of thousands of policy makers, economists, and real estate and construction experts, some of which we describe in this report, demonstrate what works and what does not. They have learned, for example, that a great deal can go wrong when the problem is not addressed in a systematic, comprehensive way—when goals and policies are not founded on solid data and all the costs and consequences have not been weighed. As we will see in the next chapter, through a series of reforms in how housing is built, financed, and maintained, cities and nations can create decent homes for all their citizens—and turn the challenge into a veritable opportunity.

2. Narrowing the affordability gap

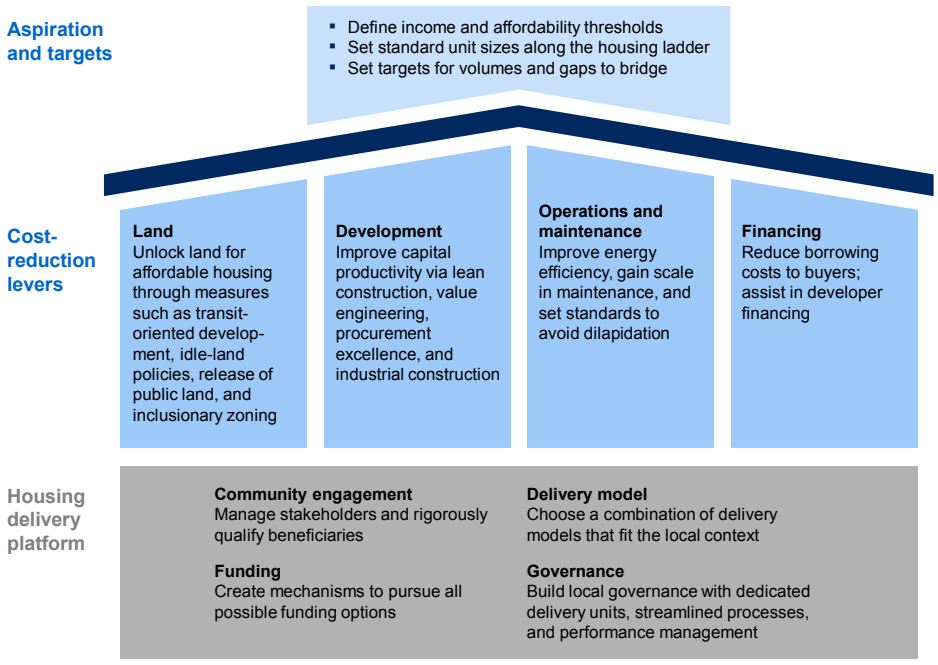
The challenge of affordable housing is massive and extends around the world, but it is not insurmountable. Our research and analysis show that action on four fronts—land acquisition, efficient construction, optimized operations, and access to financing for low-income purchasers—can narrow the $650 billion affordable housing gap. Together, these efforts can put affordable housing within reach of households making 50 to 80 percent of median income. To close the gap for households earning less than 50 percent of median income, additional measures, including subsidies, would be required.

Unlocking land at the right locations to enable employment and social integration is the most powerful lever. Development costs can be cut substantially through standardization and use of industrial approaches to construction. Additional savings are available through improved efficiency of operations and maintenance, which can be up to 30 percent of housing costs. Improving access to finance for buyers and lowering financing costs for developers is the final lever. Together, these levers can reduce costs by 20 to 50 percent.

A structured housing program can be designed using these four levers and by creating a local delivery platform. Any successful program will start with a well-thought-out process for setting aspirations and targets, using an analytical, data-driven approach (Exhibit 9).

Exhibit 9

Affordable housing can be addressed systematically: setting targets, employing cost-reduction levers, and strengthening local delivery


Aspiration and targets
Define income and affordability thresholds
Set standard unit sizes along the housing ladder
Set targets for volumes and gaps to bridge
Cost-reduction levers
Land
Unlock land for affordable housing through measures such as transit-oriented develop-ment, idle-land policies, release of public land, and inclusionary zoning
Development
Improve capital productivity via lean construction, value engineering, procurement excellence, and industrial construction
Operations and maintenance
Improve energy efficiency, gain scale in maintenance, and set standards to avoid dilapidation
Financing
Reduce borrowing costs to buyers; assist in developer financing
Housing delivery platform
Community engagement
Manage stakeholders and rigorously qualify beneficiaries
Funding
Create mechanisms to pursue all possible funding options
Delivery model
Choose a combination of delivery models that fit the local context
Governance
Build local governance with dedicated delivery units, streamlined processes, and performance management

SOURCE: McKinsey Global Institute analysis

Housing programs should be based on a broad vision of a housing ladder, with improving outcomes

Housing programs should be designed to address needs across all income segments and account for changes that will occur in the circumstances of residents and in the economics and demographics of the city over time. So programs have to be comprehensive—covering both existing housing and new developments—and include both near- and long-term objectives that reflect rising aspirations over time. Aspirations should also reflect the needs of different income groups and types of households up and down the housing ladder.

Too often, housing plans focus solely on how to create new units with minimum standards for every citizen. In the near term, this aspiration may be unrealistic, given budgetary constraints. Pursuing a too-ambitious near-term aspiration can lead to common pitfalls. For example, to fulfill minimum standards, affordable housing may be forced onto cheap land on the outskirts of the city, where residents are cut off from centers of employment and from social connectivity. Or more low-income residents crowd into substandard housing or informal settlements, because new housing meeting the minimum standards is beyond their reach until their incomes rise.

A better approach is to think about the ladder of housing aspirations, with rising standards for floor space per unit and amenities that can be met over time. This requires cities to think about both the current stock of housing and the new flow of units, and consider the needs of each income segment. To improve conditions in the short term, cities would need to ensure the refurbishment of existing units and also invest in infrastructure and social services in informal settlements. Cities also should encourage affordable rental options and transitional housing for low-income groups, including new urban dwellers. With this approach, cities can help the lowest-income citizens quickly move into safe, decent housing at locations with access to employment. At the same time that cities address the immediate needs of their poorest residents, they should work to improve the housing market for all income segments so that middle- and higher-income segments move into new housing, which can release their current homes for lower-income households. Such a ladder-based approach has been used in Hong Kong to provide decent but limited accommodation for the poorest residents, who then move up into larger units with more amenities as their incomes rise.[21]

21 Lok Sang Ho and Gary Wai-chung Wong, “The first step on the housing ladder: A natural experiment in Hong Kong,” *Journal of Housing Economics*, volume 18, issue 1, March 2009; John K. Keung, “Government intervention and housing policy in Hong Kong: A structural analysis,” in *The future of public housing*, Jie Chen, Mark Stephens, and Yanyun Man, eds., Springer, October 2013.

To craft near- and long-term plans, cities need to use a rigorous analytical approach. This can start with a thorough assessment of the status quo, including household-level data on income, housing standards (land and floor-space utilization), and the distribution of housing occupied by different income groups across the urban land area, as well as locations of centers of employment and a precise inventory of existing housing stock and planned new supply, including prices.

AN ANALYTICAL APPROACH IS NEEDED TO SET HOUSING ASPIRATIONS AND POLICY

Before cities can start to take advantage of the approaches we describe, they must first set clear aspirations for how to improve access to affordable housing in their communities. Not only do they need to understand the dimensions of the challenge in their areas and the resources that they can employ, but they must also consider what can be accomplished in the near term and what will require long-term commitments. Moreover, policy makers should weigh the ideal and the real. For example, they might assume that building affordable housing with high standards for size and quality of finish will help low-income residents enjoy a higher standard of living. In reality, low-income households might be better off in smaller quarters with basic amenities (running water, toilets), if it means they can be housed sooner and can gain access to schools and other public services and be within reach of centers of employment. This is the kind of trade-off that informs successful policy.

The first step in crafting (or updating) housing policy starts with a rigorous analytical approach to understanding needs, supply, gaps, and potential aspirations. The findings will be highly localized. In fact, two cities in the same country and cities in two neighboring nations may reach significantly different conclusions. A city's housing program should aim to improve the housing conditions of its citizens progressively through a combination of short- and long-term interventions. Two types of data are needed to inform these decisions: information about distribution of population and housing by income in the area; and the current stock of housing and future flow of new housing units (Exhibit 10).

Expert insight

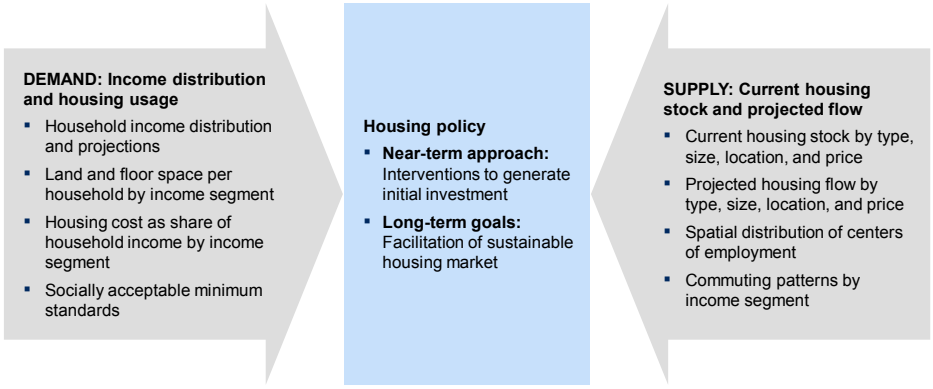
Alain Bertaud, senior research scholar at the New York University Stern Urbanization Project

Q: What are the common pitfalls in setting minimum standards?

A: It is assumed, somehow, that the lowest-income groups will be able to afford the minimum standard. There is no reason why this would be the case. Minimum standards are relatively easy to price: multiply minimum plot size by the price of land in a specific location, then add the cost of the area occupied by the standard road and open space required per plot. Add the cost of paving these roads and of other infrastructure, and add the unit cost of construction multiplied by the minimum dwelling size. This gives you the minimum cost of a dwelling as required by regulations.

Planners should calculate the minimum housing cost implied by the standards in each zone, then overlay an affordability map. They will soon see how many households are unable to afford the minimum standard and who may then be forced to live in slums or illegal subdivisions. Rather than set minimum standards, the government should look at housing used by various income groups. Developers should be allowed to subdivide land at a price that households from the different income groups can afford. The only criterion should be that the price be affordable to an existing identified income group.

Exhibit 10
An analytical approach should guide a city's housing policy


DEMAND: Income distribution and housing usage
Household income distribution and projections
Land and floor space per household by income segment
Housing cost as share of household income by income segment
Socially acceptable minimum standards
Housing policy
Near-term approach: Interventions to generate initial investment
Long-term goals: Facilitation of sustainable housing market
SUPPLY: Current housing stock and projected flow
Current housing stock by type, size, location, and price
Projected housing flow by type, size, location, and price
Spatial distribution of centers of employment
Commuting patterns by income segment

SOURCE: P. Annez et al., *Working with the market: A new approach to reducing urban slums in India*, World Bank, 2010; McKinsey Global Institute analysis

Understanding income distribution and housing use

A household-level survey is required to establish the distribution of household income and current housing usage within a city.[22] Such surveys help governments get an up-to-date overview of how households across income segments are housed; the amount of floor space and land per household, and access to amenities and infrastructure (water, sanitation, and transportation). Governments should not only analyze current households and income distributions, but also model how they would change over decades; housing programs run for long periods, during which wages, migration, demographics, and employment will evolve.

The affordability threshold—what households can spend on housing or on a combination of housing and transportation—is commonly defined by setting a percent of income (pre- or post-tax) that can be put toward housing without forcing households to forgo other essential spending. Alternatively, cities can use a cost of living approach (what would be needed in that market for housing, food, education, and health care, for example). Cities should avoid setting arbitrary thresholds and use the household survey as an input to determine the level of spending that is acceptable in the local context.

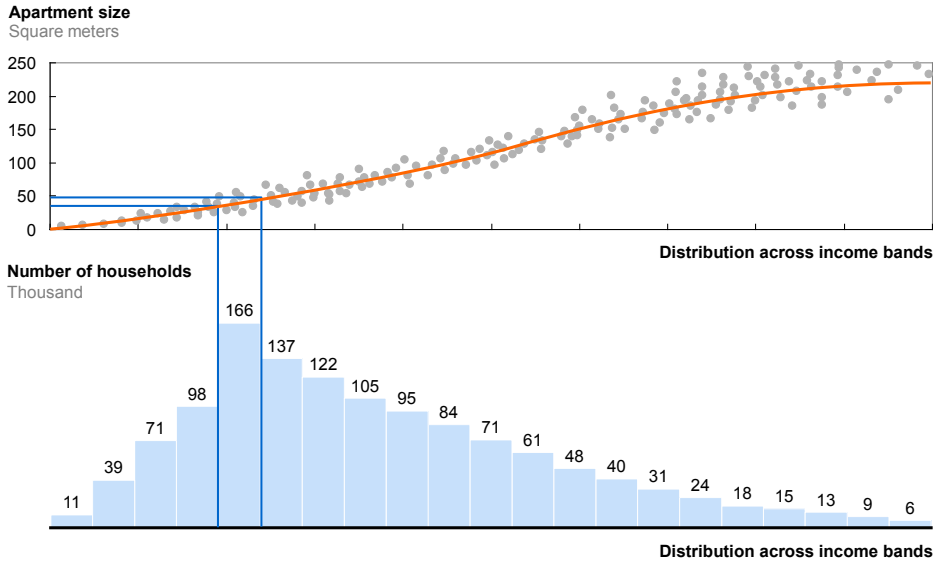
A critical—and challenging—step is determining what a standard housing unit should be. Defining the basic socially and politically acceptable housing unit for the specific community will serve as a baseline for size, amenities, and other requirements for all housing. In many countries, particularly in developing economies, the definition of acceptable floor space can vary significantly between income segments or family sizes. As Exhibit 11 shows, house size is generally correlated to income, since wealthier families are willing to pay for additional space. It also shows how much even a small increase in standard unit size can increase the number of households under the threshold.

22 Alain Bertaud, "Housing affordability in China: A stock and flow approach," presented at the Symposium on Low-income Housing in China, Beijing, July 10–11, 2009.

Exhibit 11

Minimum standards for affordable housing units should be aligned with existing housing patterns

ILLUSTRATIVE



SOURCE: Alain Bertaud, "Housing affordability in China: A stock and flow approach," 2009; McKinsey Global Institute analysis

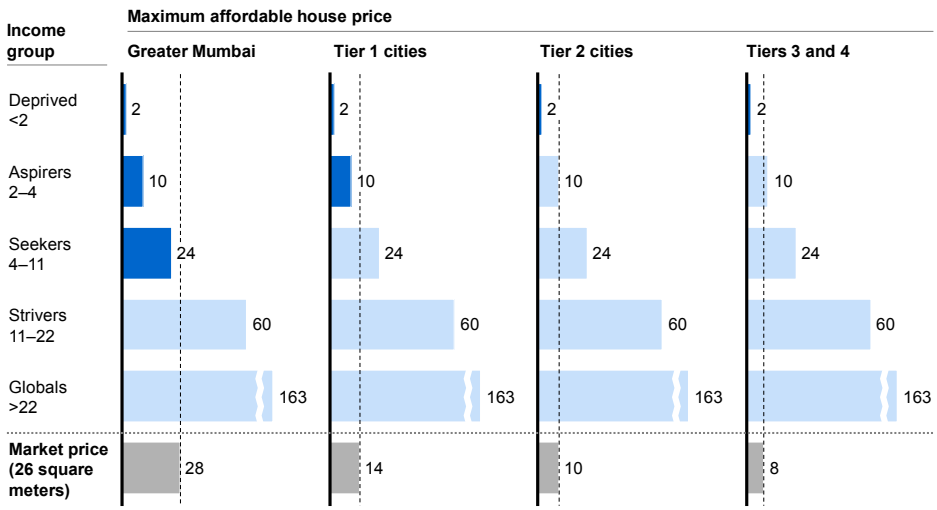
Governments should be extremely careful about how they adopt and implement minimum housing standards. A too-generous standard that becomes enshrined in regulations can raise program costs and substantially limit the number of households that can be served in the formal market. Governments also risk creating market distortions and driving growth in informal or illegal housing. Standards should be used as an aspiration rather than regulation unless there are clear health and safety concerns and the regulated minimums can realistically be met.

Exhibit 12 illustrates a real example of estimating affordability gaps for different income segments, based on a standard unit of 26 square meters in India. It uses MGI's definitions of population groups, starting with the deprived and rising up through four strata of consuming classes (aspirers, seekers, strivers, and globals). It compares income available for housing (using a 30 percent of income target) across income groups with the market price of a standard unit.

Exhibit 12

The bottom two income segments cannot afford houses at market prices in urban India

$ thousand, 2010



SOURCE: McKinsey Global Institute analysis

Understanding current housing stock and projected flow

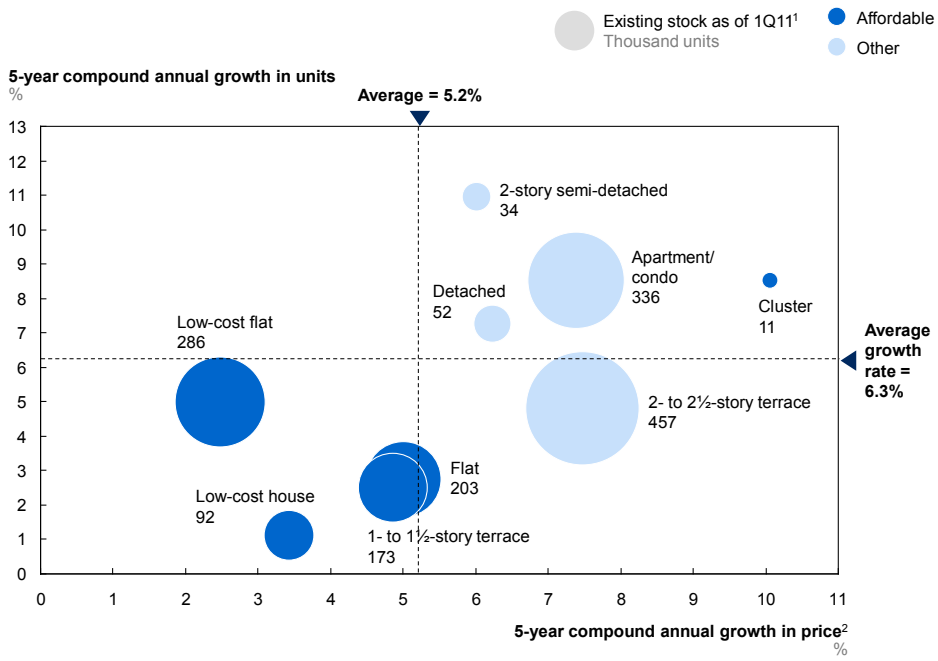
When setting housing policy, it is essential to consider both current housing stock and planned additions—across the city and across income segments. Because it typically takes a long time to build new units, cities should also focus on improving existing stock. Brazil, for example, takes a two-track approach to slum rehabilitation in its *Minha Casa Minha Vida* (My House My Life) and Growth Acceleration programs. While the programs pursue long-term development of low-income housing units, in the near term they are improving conditions in the slums with investments in infrastructure and social services. Cities should also factor in how housing stock passes from one cohort to another; older units that have been occupied by middle-income households may become home to low-income segments (and through gentrification, the opposite may occur).

A clear picture of market prices is also essential. Surveys are needed to capture current housing values by type (rental apartment, row house, detached home), size, and neighborhood. The data analysis should also include price history, and carrying costs, such as taxes and fees. The same analysis should be done for any anticipated new housing. This will enable governments to get a view of future deficits and surpluses of housing units by income group and by housing type. Exhibit 13 shows a typical stock and flow analysis by housing type for a few select cities in Malaysia.

Exhibit 13

Plotting affordable housing growth compared with market averages (for volume and price) illustrates the trends

EXAMPLE



1 Analysis excludes housing types for which average pricing data are not available (i.e., service apartments, townhouses, and one-story semi-detacheds). The excluded segments make up 2–3% of the market in total volume.
2 Based on mean sales prices per unit weighted by volume of existing stock across Kuala Lumpur and Selangor. Data on Putrajaya sales not available.

SOURCE: National Property Information Center, Malaysia (JPPH); McKinsey Global Institute analysis

Spatial distribution—how different kinds of housing are spread across the city—is another critical factor in determining housing policy. Cities should map current and future housing (for various income groups) in relation to access to transit and centers of employment to guide new housing development where it is needed for specific income bands. Current and future location of employment should be charted compared with commuting modes and times for different income segments. Then cities can use planning and land readjustment measures to unlock land and create infrastructure to support housing within an appropriate commuting radius for residents. Spatial distribution data overlaid with land prices can also inform the level of cross-subsidies required to unlock land at the right locations (see the following section on land strategies for additional detail). This will allow the housing program to be designed in a way that encourages labor mobility, social integration, and rising living standards.

Four levers can substantially narrow the affordability gap

As discussed in Chapter 1, we estimate that the affordability gap for residents of 2,400 cities around the world amounts to $650 billion per year. Initiatives in land, development, operations and maintenance, and finance could reduce the cost of basic housing by 20 to 50 percent. This would reduce the global economic affordability gap from $650 billion to between $150 billion and $320 billion, and the number of households that cannot afford housing at market rates could be reduced from 320 million to between 170 million and 230 million. This could be further narrowed by allowing smaller units or providing subsidies (Exhibit 14).

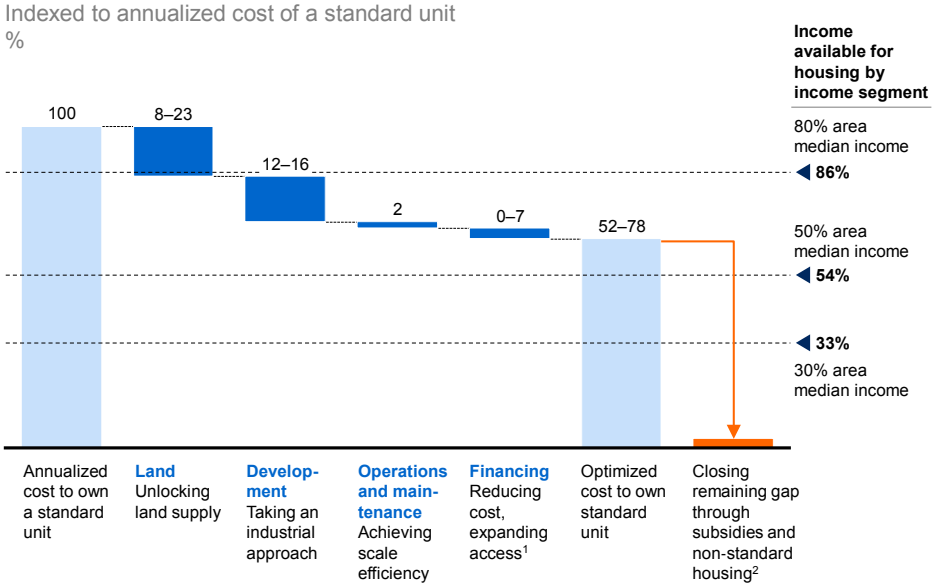
Exhibit 14

Four levers can narrow the affordability gap

Impact of levers on cost of standard unit

Indexed to annualized cost of a standard unit

%



1 Impact of reduced origination and funding costs is quantified; impact of increased access to financing is not.
2 Transitional use of basic housing (with communal toilets and kitchens, for example) to serve very low-income households.

NOTE: Numbers may not sum due to rounding.

SOURCE: McKinsey Global Institute analysis

Through public land provisioning or cross-subsidies such as inclusionary zoning requirements (mandating that a portion of any project be affordable) or density bonuses for developers (in exchange for providing affordable units), land costs for affordable housing can be reduced to essentially zero in some instances. We estimate that construction costs could be reduced by 20 to 30 percent through value engineering, industrial construction approaches, and other efficiency measures. Improvements in energy efficiency and maintenance could reduce operations and maintenance costs by 10 to 15 percent. The cost of financing home purchases by lower-income groups also can be reduced.

Overall, these measures can reduce costs of delivering a typical standard housing unit by up to 50 percent. If all these measures are implemented fully, households earning more than 50 percent of area median income would be able to afford basic housing and, of the 106 million new urban low-income households that are expected to be added by 2025, 65 million could be housed affordably.

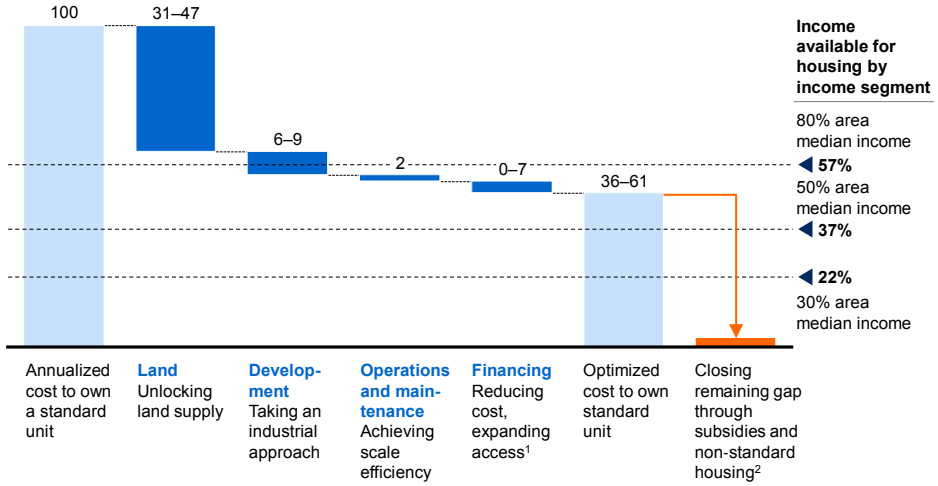
In the least affordable cities, even with cross-subsidies to reduce land acquisition costs and improvements in construction productivity, operations, and access to finance, households with 80 percent of area median income may still face challenges to obtain a standard dwelling unit at prevailing market prices (Exhibit 15). Everyone below 50 percent of area median income would likely require further direct or indirect subsidies to afford a unit.

Exhibit 15

In the least affordable cities, cross-subsidies can reduce costs, but large affordability gaps would remain

Impact of levers on cost of standard unit in top 10 cities with highest affordability gap

Indexed to annualized cost of a standard unit
%



1 Impact of reduced origination and funding costs is quantified; impact of increased access to financing is not.
2 Transitional use of basic housing (with communal toilets and kitchens, for example) to serve very low-income households.
NOTE: Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute analysis

To tackle the housing challenge for lower-income segments, governments would need to employ the four levers, provide additional subsidies, and consider adjustments to standards for affordable housing units. Direct assistance can take the form of rental vouchers or even providing very basic public-housing facilities in locations that would give poor workers access to employment. The aim would be to progressively improve standards as incomes rise, as Hong Kong has done. In the near term, governments need to make judicious decisions about basic standard units and the extent to which they can fund direct subsidies. Such an approach, over the long term, could help close the affordability gap for even very low-income households, where public finances permit.

These rough estimates are based on analysis of potential improvements and case examples. However, each country and city has a different starting point and conditions vary widely, which affects how well any of the four levers will work. Also, societies have very different appetites for providing the cross-subsidies and other incentives to maximize opportunities for land acquisition or inclusive financing. Any global analysis needs to be understood as a rough scenario that indicates the order of magnitude of the potential impact. Nonetheless, with full application of actions on all four fronts, cities around the world can improve housing affordability to the point where families can aspire to decent housing and the affordability gap can be substantially reduced.

Unlocking land supply at the right location is the most critical step in providing affordable housing

Nothing has greater impact on the success of affordable housing initiatives than acquiring land in the right place at the right price. Minimizing land cost is essential for creating housing at affordable price points, and it is critical that the land be in the right location. As has been seen in too many cities, housing built in the wrong location, no matter how well constructed and maintained, will fail. In the right locations—where residents are within reach of jobs, schools, and vital services and where they can become part of the diverse fabric of the city—affordable housing can truly fulfill its promise as the foundation for a decent standard of living.

THE BARRIER: URBAN LAND SHORTAGES AND HIGH COSTS

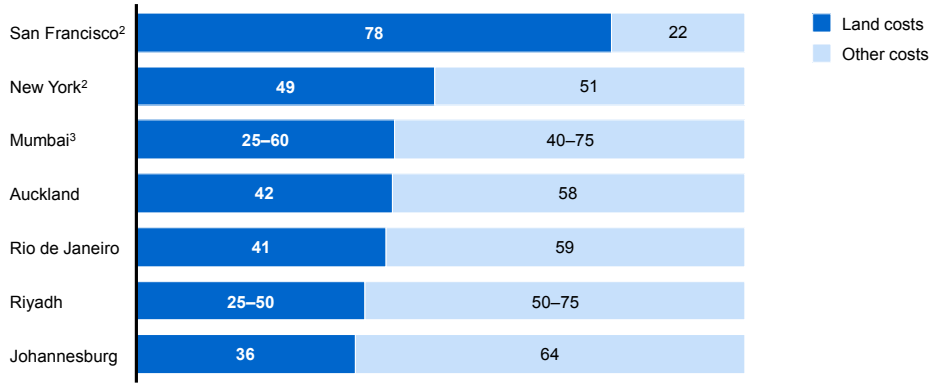
Securing land in the right place at the right price presents a considerable challenge for developing successful affordable housing. Land is generally costly and often unavailable. In major metropolitan areas, such as Rio de Janeiro and Auckland, it is not uncommon for the cost of land to exceed 40 percent of total property price (Exhibit 16). In extreme cases, like San Francisco, the share can stretch to as much as 80 percent. This is in stark contrast to more affordable places such as Oklahoma City or Rochester, New York, in the United States, for instance, where land is typically around 20 percent of housing prices.[23] In cities with very high land prices, if affordable housing is built at all, it may be far from employment and vital services and unlikely to provide the economic and social integration that low-income households need to rise from poverty.

Exhibit 16

Many cities have very high land costs as a share of total housing unit cost

Average share of land costs in unit price[1]

%



1 Mumbai, Rio de Janeiro, and Riyadh, 2009; Auckland, Johannesburg, New York, and San Francisco, 2013.
2 New York and San Francisco figures represent "land value share of home value."
3 Range estimated from average property price and sample land transaction in Goregaon, Malad, Chembur, and Mulund, where land transaction data were available. Assumed floor-area ratio = 1.33 as average of Mumbai city.

SOURCE: *Land and property values in the US*, Lincoln Institute of Land Policy; Guanyu Zheng, *The effects of Auckland's metropolitan urban limit on land prices*, New Zealand Productivity Commission, March 2013; TOKİ website; expert interviews; ABSA Report; Mumbaipropertyexchange.com; Sulekha.com; McKinsey Global Institute analysis

23 Morris A. Davis and Michael G. Palumbo, *The price of residential land in large US cities*, Federal Reserve Board, Finance and Economics Discussion Series number 2006–25, May 2006.

In many cases, policy exacerbates the land shortage and pushes up costs, as cities attempt to constrain new development. Many cities use regulations to explicitly reduce the pace of development, imposing restrictive zoning to preserve open space and avoid congestion and other side-effects of growth and densification.[24] These restrictions take many different forms: phased development plans, urban growth boundaries, or permanent greenbelts (used in London). In San Francisco and Seattle, community resistance to development has resulted in permit caps or moratoria on construction.

Purely economic considerations also play a role in policies to limit growth; existing homeowners and owners of rental properties have incentives to limit the housing supply to maintain values and rents.[25] At the same time, cities may use exclusionary zoning rules, such as large minimum lot sizes, specifically to attract higher-income taxpayers.

In practice, restrictive zoning can severely limit new construction and result in higher housing prices than in comparable cities that have fewer restrictions, exacerbating the affordable housing challenge.[26] High land prices push developers toward building higher-cost housing and if affordable housing is built, it may be pushed to lower-cost land on the outskirts of cities.

Even when zoning is not an issue, large stretches of developed land sometimes remain off the market for a variety of reasons. Owners may face difficulties in development resulting from fragmented, irregularly shaped, or unregistered parcels of land. There may also be hoarding and speculative landholding in the hopes of realizing windfall gains.

The market responses to housing demand and price shifts vary widely (Exhibit 17). In elastic markets, three times the number of new housing units are developed for a given level of home price increase than in inelastic ones; the US market is 14 times as responsive as the Swiss market to price changes. Regulations affecting land supply, particularly zoning and permitting processes, play a large role. There is ample literature showing how regulations can cause housing prices to rise.[27]

24 For an overview, see Christopher T. Boyko and Rachel Cooper, "Clarifying and re-conceptualising density," *Progress in Planning*, volume 76, 2011.

25 François Ortalo-Magné and Andrea Prat, "On the political economy of urban growth: Homeownership versus affordability," *American Economic Journal*, volume 6, number 1, February 2014.

26 Rolf Pendall, Robert Puentes, and Jonathan Martin, *From traditional to reformed: A review of the land use regulations in the nation's 50 largest metropolitan areas*, Brookings Institution, August 2006.

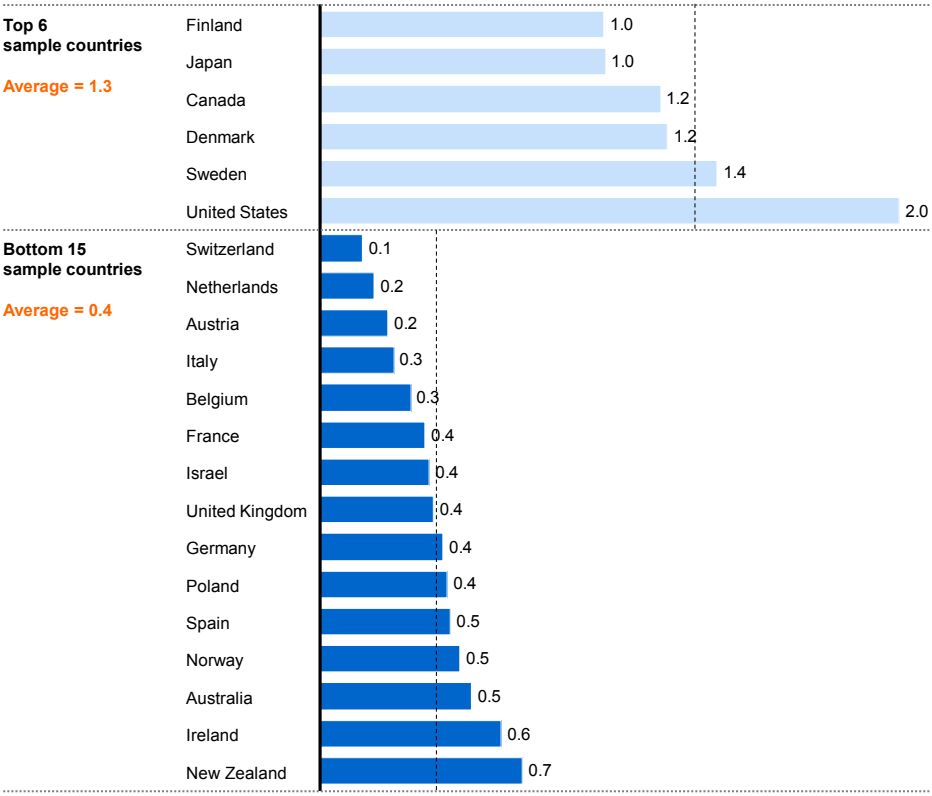
27 For an overview, see Michael H. Schill, "Regulations and housing development: What we know," *Cityscape*, volume 8, number 1, 2005.

Exhibit 17

In many places, housing supply does not respond to price increases

Estimates of long-run price elasticity of new housing supply

% change in supply of housing in relation to % change in market price



SOURCE: Aida Caldera Sanchez and Asa Johansson, *The price responsiveness of housing supply in OECD countries*, OECD Economics Department working paper number 837, May 2011; McKinsey Global Institute analysis

SIX WAYS TO MAKE LAND AVAILABLE

Around the world, six major policy approaches have been used successfully to develop or unlock land or to increase the density of land to create affordable housing at the right location. With the right parameters in place, value created from supplying additional land for market-rate development can be used to subsidize construction of affordable housing. In effect, land can then be supplied for affordable units at marginal or even no cost. Additionally, structural changes to the way land is regulated or used can improve the efficiency of the entire housing market. Here we describe these six strategies for acquiring land and raising density to accommodate affordable housing.

Smart, transit-oriented development

"Smart growth" approaches combine transportation infrastructure, housing, and commercial development. They can turn vacant land or run-down neighborhoods into vibrant communities that can also accommodate affordable housing. Access to public transit reduces the need for cars (which households that need affordable housing may not be able to afford), links residents to employment and vital services, and raises the value of land in the surrounding area.

Unfortunately, high land costs force development of housing for low-income households to areas where land is cheap, but where affordable housing projects may fail. Affordable housing that is not well connected to centers of employment and vital services cannot help residents integrate with society and make economic progress, limiting its appeal (see Box 2, "Building on the wrong land: The price of sprawl"). To create opportunities for employment and encourage labor mobility, land for affordable housing should be chosen so that residents can reach employment centers within a one-hour commute. Because private transportation is often too expensive for low-income households, access to public transit becomes an important priority.

Transit-oriented development, therefore, holds great promise for successful housing development. It creates compact, dense, well-connected neighborhoods with mixed-use (residential and commercial) buildings that are within walking distance of public transportation. Density makes the most of available land, allows infrastructure development at relatively low cost, and has environmental and livability advantages, as well. Importantly, transit-oriented development also can be nearly self-funding. There is a strong link between transit infrastructure and property values, with prices rising 30 to 60 percent in neighborhoods with new transit stations. Part of that incremental value can be captured to finance both the new infrastructure and affordable housing.

Hong Kong provides a good example of transit-oriented development (Exhibit 19). Over the past four decades, the city added 1.4 million households in the New Territories, across the harbor from Hong Kong Island. Extensive railway networks connect the New Territories to the island and extend across the city: 43 percent of residents and 56 percent of jobs in Hong Kong are located within 500 meters of rail and metro stations, and 90 percent of all journeys take place on public transport. The Mass Transit Railway Corporation builds, maintains, and operates the network without subsidies by generating around 50 percent of its revenue from developing and renting or selling commercial and residential property on developments around station areas. The residential property around the stations includes a sizable mix of affordable housing (Exhibit 20). While affordable housing continues to be an area of public debate in Hong Kong, its smart transit-oriented development strategy has been important to the city's transition from a low-cost manufacturing location to an increasingly wealthy services-based economy.

In Hong Kong, transit-oriented development benefited from a culture that was comfortable with high densities, the opportunity to build in greenfield locations, and public landownership. Transit-oriented development has been used in other settings as well. In Denver, for example, new transit lines and affordable housing are growing in tandem along designated corridors. To preserve affordable housing near the new transit lines, a non-profit partnership purchased low-income, multifamily properties and committed to keeping them affordable for households earning 40 percent of area median income. Additionally, using Low Income Housing Tax Credits, HOME grants, and a land-lease partnership, the non-profit was able to rehabilitate the affordable units.[28] Without these efforts, the low-income residents in the area would be pushed out as market prices rise and would not receive the benefits of the new transit line.

28 Leo Quigley, ed., *Preserving affordable housing near transit: Case studies from Atlanta, Denver, Seattle and Washington*, Enterprise Community Partners, National Housing Trust, and Reconnecting America, 2010.

Box 2. Building on the wrong land: The price of sprawl

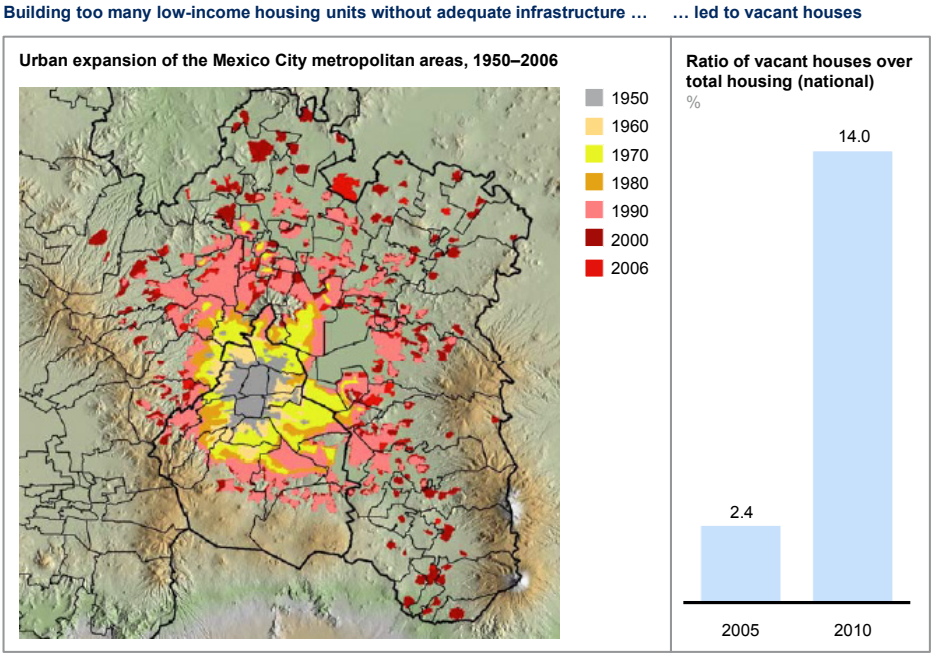
One way to get around high land costs is to build in undeveloped areas beyond existing city limits. However, attempts to develop low-income housing on urban fringes have frequently failed, due to lack of infrastructure and social inclusion. New Cairo in Egypt is a case in point. Back in the 1960s, Cairo faced a housing crisis, with a rapidly growing population, limited land, and deteriorating and outdated housing stock. The solution was to expand the city to include "New Cairo," 30 kilometers to the east.

The effort was a failure because even though New Cairo offered decent housing and low population density—a relief from the overcrowded slums of the old city—the area was cut off from the social and economic life of Cairo. Even the poorest residents could not afford to live there because they had no means to make a living. Industrial tenants could not be lured to the remote area, so jobs did not materialize. The transportation infrastructure did not keep pace with the development, and residents could not reach centers of employment in Cairo within a one-hour commute. Today, New Cairo has been redeveloped as an enclave for the wealthy and a site for corporate offices.

In Mexico City, a great deal of new housing was developed in recent decades. In the past ten years alone, about 700,000 units were added, an increase of more than 10 percent. Many of those new houses, however, were built on the periphery of Greater Mexico City, an area of nearly 1,500 square kilometers. The state allowed new settlements even before such basic services as schools, health care, or water systems were provided. Often, these amenities never appeared at all. Some developments were so far from the city center that workers faced commutes of 90 minutes each way. As a result, some developments became ghost towns, contributing to a sharp rise in abandoned housing in Mexico: in 2010, 14 percent of housing units in Mexico were unoccupied, more than five times the rate in 2005 (Exhibit 18).[1]

Exhibit 18

Urban greenfield development in outlying areas can fail if adequate infrastructure, including transportation to employment, is not built



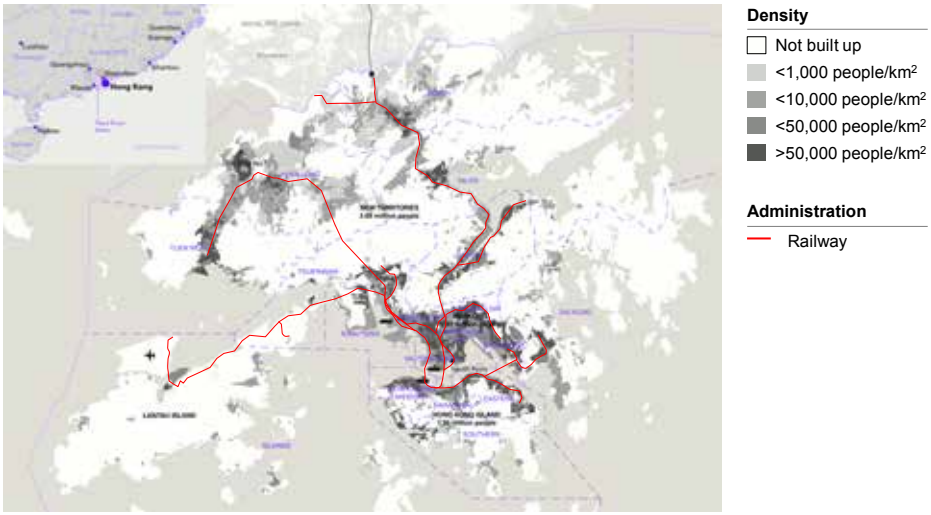
SOURCE: Whitney Eulich and Lauren Villagran, "In Mexico, low-income homeowners watch their dreams crumble," *The Christian Science Monitor*, June 26, 2013; Eric Dickson, Judy Baker, Daniel Hoornweg, and Asmita Tiwari, *Urban risk assessments: An approach for understanding disaster and climate risk in cities*, World Bank, 2012; Google Maps; Encuesta sobre la situación de vivienda de acreditados 2010; Encuesta de casas abandonadas julio 2009 IPSOS (Matamoros, Mexicali); McKinsey Global Institute analysis

1 Whitney Eulich, "In Mexico, low-income homeowners watch their dreams crumble," *The Christian Science Monitor*, June 26, 2013.

Exhibit 19

Hong Kong developed new housing and neighborhoods along railway lines

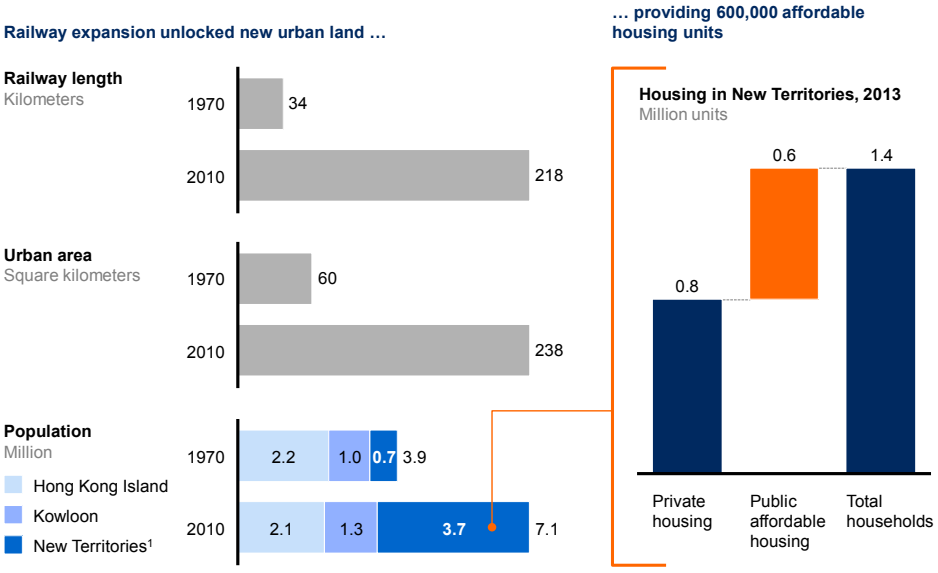
Built area and railway of Hong Kong metropolis



SOURCE: Jens Kandt, *Hong Kong's spatial DNA*, LSE Cities, November 2011; Earth Observation and Remote Sensing Applications, 2008; Government of Hong Kong; McKinsey Global Institute analysis

Exhibit 20

Hong Kong's transit-oriented development unlocked land for new housing



1 Includes Kwai Tsing, North, Sha Tin, Sai Kung, Tai Po, Tuen Mun, and Yuen Long.

SOURCE: 2008 International Workshop on Earth Observation and Remote Sensing Applications; Government of Hong Kong; Langdon & Seah; McKinsey Global Institute analysis

In the Minneapolis/St. Paul region in the state of Minnesota, the Corridors of Opportunity Initiative was launched in 2011 to help low-income communities through new light-rail development. Government, the private sector, and non-profit agencies are collaborating to develop housing projects along new rail corridors. These partners benefit from access to a revolving loan fund and favorable regulatory status for affordable housing projects. This consortium also raises the profile of housing needs in conjunction with transit.

Release public land at the right location for housing

Public-sector entities are substantial landowners in cities around the world and because a good deal of public land is not used to its full potential, it can be a good source of land for affordable housing. It is not uncommon for government to own more than half of the land in a city. In Ahmedabad, India, three-quarters of the land is retained by the government for roads, utilities, open spaces, or government buildings, or is reserved under town planning schemes.[29] Much of the land is severely underused and valued below market prices, and an increase in land values rarely leads to the corresponding adjustments of public land use. Most importantly, many of these parcels are a legacy of historical ownership and in well-serviced locations, which makes them ideal for affordable housing developments.

Governments can play an invaluable role in assembling or releasing public land for affordable housing development. Administrative hurdles—such as unwieldy multiyear processes for clearing projects with the proper authorities—delay and discourage needed development. This makes it critically important for cities to be able to quickly identify, coordinate, and assemble land held by public-sector entities and authorities. Releasing such public land could ease the affordability gap and also monetize underused resources in order to generate new funding streams for affordable housing.

Governments are not always aware of all the land at their disposal. Cities should inventory their land holdings regularly and map marketable parcels (noting property values) to identify land that could be released or sold to generate funding for affordable housing.[30] It is much simpler and more efficient to repurpose public land than to spur the development of private property.

In Turkey, the TOKİ housing agency has assembled 4,120 square kilometers, or 4 percent of urban land, largely by acquiring land from other government entities, such as the police. Over 30 years, it has acquired land by exchanging assets or services, through direct purchases, or via legal procedures. Once the land has been acquired, TOKİ works with private development partners that build market-rate housing on higher-value plots and split revenue with TOKİ. The agency uses its share of revenue to fund further land acquisition and development. The majority of land is used for affordable housing units that are priced at about 30 percent below market rates—essentially giving away the land at a subsidized cost to home buyers (Exhibit 21). In addition, TOKİ enjoys reduced value-added tax rates (1 percent, rather than 18 percent), an exemption from land tax, lower stamp duties, and reduced cost for registration and other regulatory requirements. From 2003 to 2013, TOKİ released more than 160 square kilometers of public land to develop more than 500,000 housing units, or around 10 percent of total housing development in Turkey. During this time, its partners built 90,000 market-rate units.[31]

29 Alain Bertaud, *Converting land into affordable housing floor space*, World Bank policy research working paper number 6870, May 2014.

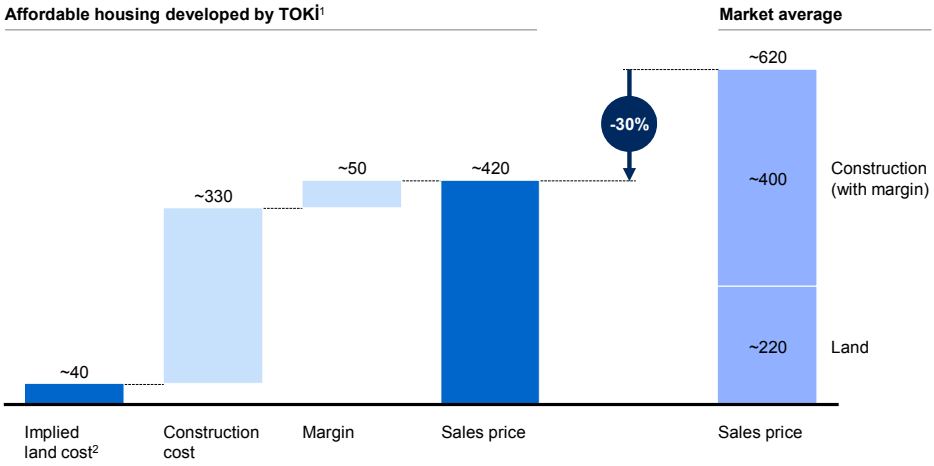
30 Shirley Ballaney, et al., *Inventory of public land in Ahmedabad, Gujarat, India*, World Bank Sustainable Development Network policy research working paper number 6664, October 2013.

31 Housing Development Administration of Turkey (TOKİ) website.

Exhibit 21

Release of public land at marginal cost can help deliver units at affordable prices

Estimated cost per square meter
$



1 Turkey's Mass Housing Administration.
2 Theoretical cost of land reverse engineered calculated by "sales price-construction cost-margin."
SOURCE: TOKİ website; expert interviews; *Real Estate News Turkey*; Gardiner and Theobald; McKinsey Global Institute analysis

To support rapid urbanization, China's government releases public land to the market every year. In 2013, it released 7,000 square kilometers, equivalent to around 3 percent of overall industrial, commercial, and residential land in the nation.[32] Developers purchase development rights and 70-year ground leases. The city of New York is also undertaking a review of all government-owned land to assess whether it is properly and fully utilized or could be redeveloped to increase land supply for affordable housing or other uses.[33]

Unlock vacant serviced land through regulatory measures such as idle-land regulations

In cities around the world, the solution to unlocking land supply may be in plain sight: land that is at the right location for affordable housing but that remains vacant for a variety of reasons. Not all vacant land can be brought forward for development. Some large parcels are "banked" by cities for future development or to use for infrastructure or public buildings. Corporations also keep reserves for expected expansions. Certain land areas are difficult to develop due to shape or small sizes. However, in many instances, some land is withheld by owners for speculation. Depending on the nature and context of the land markets within a city, speculative land holding can become a substantial obstacle. However, there are ways to unlock private land for development of affordable housing.

In Riyadh, for example, our analysis identified 1,141 square kilometers of vacant land, much of it with reasonable access to infrastructure. A sampling of geographical information system (GIS) data of land parcels within core city area indicates that as much as 40 square kilometers of land zoned for residential use and connected to infrastructure has remained idle since 1999 through multiple

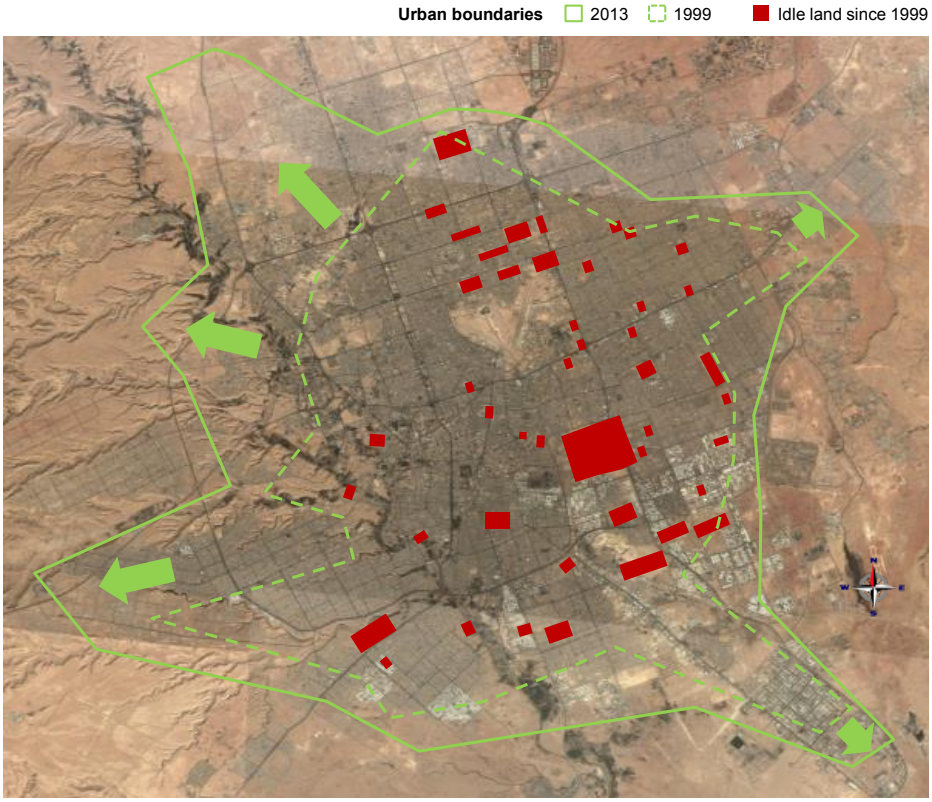
32 China Ministry of Housing and Urban-Rural Development.

33 *Housing New York: A five-borough, ten-year plan*, City of New York, 2014.

revisions and expansions of the city boundaries (Exhibit 22). During this time, land values have risen from $300 per square meter to $1,500 in prime locations.

Exhibit 22

A sampling of land parcels in Riyadh indicates at least 30 to 40 square kilometers of idle, serviced residential land



SOURCE: Google Earth Pro; McKinsey Global Institute analysis

In Nairobi, our analysis of satellite imagery overlaid with land use suggests that about 40 percent of residential area remains vacant (Exhibit 23). This land could be used to accommodate housing that would be well connected to infrastructure but has not been developed for the past 15 years due to landholding, speculation, and ownership patterns. Meanwhile, Nairobi suffers from a severe shortage of land for housing: two-thirds of the population is squeezed onto less than 2 percent of the land, typically in 10-by-10–foot shacks.[34] With rising land prices, development has headed toward the outskirts, causing problems related to sprawl.

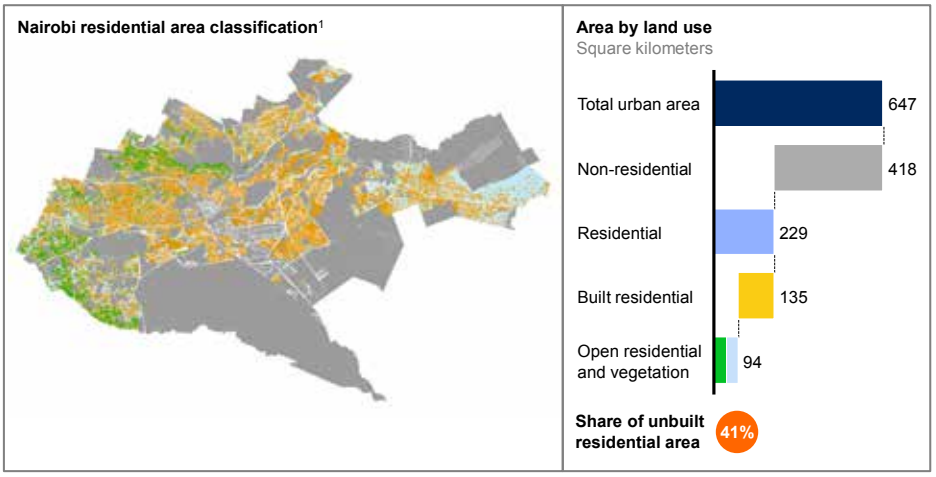
Several factors prevent the development of available serviced land near the center of Nairobi. Legal titles and certificates required to build new structures are difficult to obtain. Building permit costs approach 1 to 1.5 percent of total project costs. Interest rates to finance development are high. And developers hoard land, speculating on price increases.[35] Although some vacant land may not be developable, unlocking even part of it can greatly contribute to the affordability of housing. In addition, idle public land exists even in the city center

34 "Kenya's slum dwellers: Tangles over tenure," *The Economist*, September 22, 2012.

35 "Housing shortage looms, warn Nairobi developers," *Nairobi News*, April 16, 2014.

in a country where it is estimated that close to 70 percent of land to belongs to the government.[36]

Exhibit 23
In Nairobi, approximately 40 percent of residential land is unbuilt



1 Land use is defined by public source; built/open/vegetation area is defined from satellite map.
SOURCE: "GIS maps—Nairobi," The Trustees of Columbia University in the City of New York; McKinsey Global Institute analysis

In Latin America, speculation is a major factor in land availability. In Atibaia, a city connected to the São Paulo metropolitan area, 22 percent of urban land that was regarded as ready for development was idle in 2009.[37] Researchers found that 60 percent of those parcels had been idle for more than 14 years and that more than 10 percent had been idle since 1962—for a half-century during which the city area tripled and population rose tenfold.[38] In the United States, around 18 percent of urban land remains vacant and in five of 91 surveyed cities, speculation was a key concern.[39] Other leading reasons for vacant urban land cited in the survey were small parcel sizes, odd parcel shapes, and undesirable location.

One way to persuade owners to bring forth unused urban land for development is to raise the cost of holding it. Cities have done this by imposing a special idle-land tax on residential parcels of a certain size.[40] The additional tax may persuade the owner to develop or sell the land and gives the owner the option to retain some or all the land as an investment asset. The tax can be targeted in specific zones where housing is most needed. The idle-land tax is also a way for governments

36 Margaret Wahito, "Developers seek idle government land," *Capital FM*, June 6, 2013.

37 Nora Clichevsky, "Vacant land in Latin American cities," *Land Lines*, volume 11, number 1, January 1999.

38 Daniel Iozzi Sperandelli, Francisco Dupas, and Nívea Dias Pons, "Dynamics of urban sprawl, vacant land, and green spaces on the metropolitan fringe of São Paulo, Brazil," *Journal of Urban Planning and Development*, volume 139, December 2013.

39 Ann O'M. Bowman, and Michael A. Pagano, "Transforming America's cities: Policies and conditions of vacant land," *Urban Affairs Review*, volume 35, number 4, March 2000.

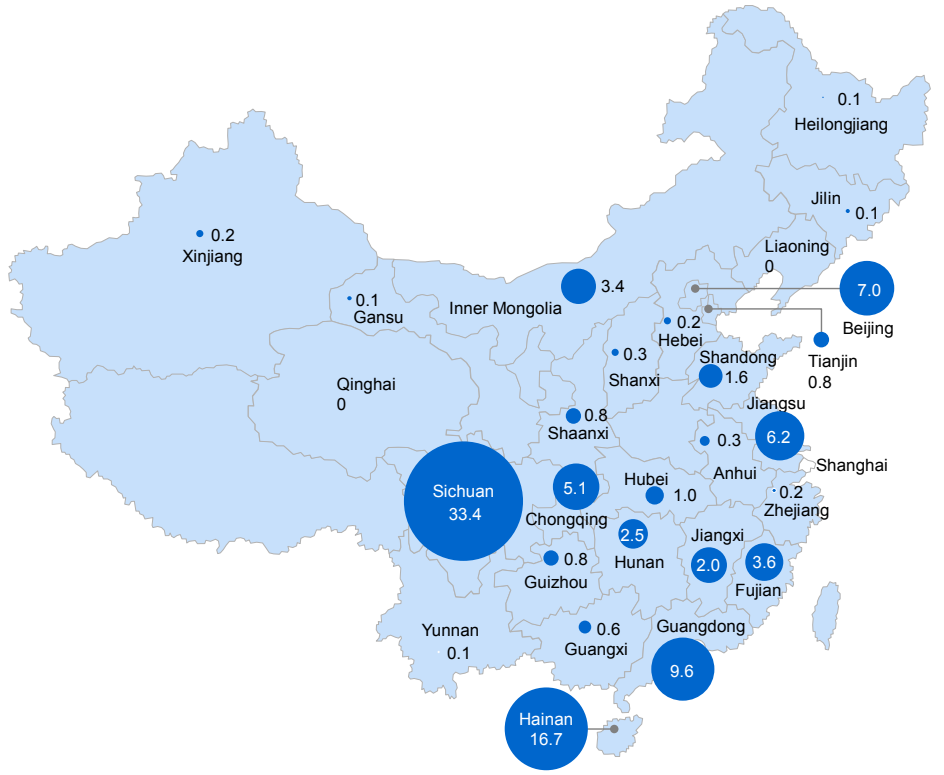
40 Richard F. Dye and Richard W. England, "The principles and promise of land value taxation," in *Land value taxation: Theory, evidence, and practice*, Richard F. Dye and Richard W. England, eds., Lincoln Institute of Land Policy, 2009.

to redistribute the "unearned betterment" of properties in areas that are experiencing rising values, including as a result of investments in infrastructure.

China imposed idle-land regulations after developers purchased 2,160 square kilometers of government land between 2001 and 2007, but developed only 60 percent of it. This kept 870 square kilometers, or 3 percent of the total urban area, vacant during this period when land values were increasing by about 10 percent annually. In 2010, the government conducted an inspection that revealed that 97 square kilometers were hoarded by developers, presumably for speculation (Exhibit 24). To discourage hoarding, the administration levied a new tax equivalent to 20 percent of land acquisition price if land remained idle for one year; after two years, rights to the land could be revoked. It also stopped disbursing loans to developers involved in land hoarding and strengthened the monitoring of local municipalities.[41]

Exhibit 24

China launched an inspection program that identified 97 square kilometers of idle land



SOURCE: China Ministry of Land and Resources; NetEase; Feng Zhe, "China issues land hoarding blacklist," *Caixin Online*, August 13, 2010; McKinsey Global Institute analysis

In the United Kingdom, land hoarding has also been widespread, hampering efforts to develop new affordable housing. In 2012, when 1.8 million households were on waiting lists for social housing, only 98,000 housing units were built. Meanwhile, 400,000 plots already approved for development remained idle. In London alone, 45 percent of land with permission to be developed remains idle. In response, a political proposal would allow local councils to charge developers a fee for hoarding or even issue a compulsory purchase order. This proposal has

41 Feng Zhe, "China issues land hoarding blacklist," *Caixin Online*, August 13, 2010; China National Bureau of Statistics; China Ministry of Land and Resources.

met with resistance from home building associations, which argue that reducing permitting time would be a better way to facilitate development.[42]

A number of cities have a specific tax on unused land or use incentives to encourage development of vacant land. The city of New York, for instance, established the 421-a tax scheme in 1971 that exempted all new residential property developments from property taxes for ten years to encourage the redevelopment of thousands of unused plots in blighted areas. Currently, the city is considering taxing vacant lots, underused lots, and shuttered residential buildings. In 2001, Brazil established a progressive vacant-land tax that increases the longer the land remains unused (although it is not applied consistently).[43] This points to why governments need to be careful in the design of idle-land tax policies and simultaneously think about enforcement mechanisms.

In the Philippines, the government allowed municipalities to impose an idle-land tax such that any non-agricultural property of more than 1,000 square meters in any city or municipality that remains unused can be subject to property tax surcharge equivalent to as much as 5 percent of assessed value. There are exceptions for natural disasters or other circumstances that physically prevent the owner from development. An increasing number of municipalities have opted to impose this tax, and they receive technical assistance from the Philippine Department of Finance on the implementation.

Spur development through land assembly or readjustment

Complex ownership structures and fragmentation of land parcels or lack of infrastructure provisioning hold back development, even where land is vacant and underused or properties are dilapidated. Governments may need to acquire or expropriate such land using eminent domain provisions or to facilitate the pooling of land by existing owners in a participative way.

Public authorities often have extensive powers to assemble land for housing and other uses. In the Netherlands, municipal land companies purchase land under land assembly plans and have pre-emption rights over other buyers, including an option to expropriate land at existing-use value (before value gains from redevelopment) and pay compensation to individuals from the income from new developments.[44] In Spain, the law similarly grants municipal developers the right to acquire land at existing-use value.[45]

When land is assembled, owners are paid for their land or receive a new land parcel in the developed site, land at another site, a developed unit, cooperative housing, or equity in the development group. Public land banks are a common instrument for holding a share of the assembled land, which is used for development of public amenities or sold to finance public infrastructure. Another

42 Patrick Wintour, "Ed Miliband issues warning to developers over 'hoarding' of land," *The Guardian*, June 20, 2013.

43 Daniel Iozzi Sperandelli, Francisco Dupas, and Nívea Dias Pons, "Dynamics of urban sprawl, vacant land, and green spaces on the metropolitan fringe of São Paulo, Brazil," *Journal of Urban Planning and Development*, volume 139, December 2013.

44 Sarah Monk et al., *International review of land supply and planning systems*, Joseph Roundtree Foundation; *Land assembly and redevelopment*, Georgia Department of Community Affairs, March 2013.

45 Nico Calavita, and Alan Mallach, eds., *Inclusionary housing in international perspective: Affordable housing, social inclusion, and land value recapture*, Lincoln Institute of Land Policy, July 2010.

option is the land trust model, under which one party (a government agency, a private owner or consortium, or non-profit group) owns the land and the tenants own the structures with long-term leases on the land. Community land trusts, such as the Crescent City Community Land Trust in New Orleans, use this model explicitly to increase affordable housing opportunities by acquiring and developing vacant land for housing, selling units to low-income residents, and retaining the ownership of the land through a co-op model, which requires units to be resold to low-income households.

The acquisition process for land assembly begins with an overall development plan of a public or private developer that identifies public and private parcels that are required for a development site, and an assembly scheme. In the most basic approach, the developer or authority simply purchases all required land from owners, either through mutual agreement or expropriation (with proper notification and compensation). Alternatives are land swaps and land sharing. Land swaps (exchanges of parcels) have been used in cities such as Arlington, Virginia; Dublin, Ireland; and Vancouver, British Columbia, to build affordable housing. Land-sharing schemes can help avoid relocation. In land-sharing schemes, the developer or authority allows landowners to remain on part of the land and develops the most economically attractive parts.[46]

Another commonly used approach is land pooling or land readjustment, in which the developer or public authority assembles numerous parcels, subdivides the whole, and prepares the land for use (bringing in roads and other infrastructure, for example). Then the public authority returns parts of the land to owners in proportion to their original parcels and sells the remainder to cover costs.

Land readjustment has been used extensively in Japan, South Korea, and in the Indian state of Gujarat. The origins of this approach date back to early 20th century, taking its roots from the "Lex Adickes" in Germany.[47] During the development, a project organization, either public or private, readjusts lots based on a publicly approved plan and develops infrastructure such as roads, parks, and water systems. The plan requires approval by a specified share of the landowners. Sale of "reservation land" taken from landowners covers the cost of development. The owners benefit from land-value increases after development. Japan applied land readjustment extensively after the Kanto earthquake in 1923 and after World War II, helping close a postwar housing shortage of more than two million units by 1964. By 2000, around 30 percent of total urban area in Japan had been developed through this method.[48]

The state of Gujarat in India has adopted a two-stage land readjustment known as the Town Planning Scheme to develop land in the urban peripheries or even to redevelop dense informal settlements. In the first stage, an overall development plan is created for the city by identifying areas of urban growth and primary infrastructure expansion. In the second stage, detailed micro-plans and a

46 Paul E. Rabé, *Land sharing in Phnom Penh and Bangkok: Lessons from four decades of innovative slum redevelopment projects in two Southeast Asian boom towns*, University of Southern California, School of Policy, Planning and Development.

47 Y. Ishida, "A short history of Japanese land readjustment (1870–1980)," in *Comprehensive Urban Studies*, number 28, Tokyo Metropolitan University, 1986.

48 Konami, Hirohide, "Japanese efforts to supply low cost housing," presented at 42nd EAROPH (East Asia Regional Organization for Planning and Housing) Regional Conference in Ulaanbaatar, Mongolia, September 24, 2009.

sequence for development are created for a number of smaller areas, usually between 1 and 2 square kilometers. Then, government builds roads, public amenities, utilities, and social spaces within the area and may reserve some land for sales to recover its infrastructure costs. Some land can be set aside for development of affordable housing. The land required for all these elements is then proportionally deducted from the land area of each landowner.

With the new infrastructure, the land value of the entire district increases significantly, providing compensation for owners. The government raises additional funds to pay for infrastructure costs by charging landowners a betterment levy based on a percentage of the increase in land value (net of compensation) for the original land price before the readjustment is implemented. Once the process is completed, the landowner is free to develop, retain, or sell the land.

The process creates incentives for landowners to pool their parcels by letting them participate in land-value gains, which shortens implementation time. Additionally, funding from development gains allows infrastructure development to proceed in tandem with housing construction. With inclusionary zoning in such readjustment projects, land can also be unlocked for affordable housing development, and higher-priced housing developed in such parcels can open up older housing stock within the city for lower-income segments.

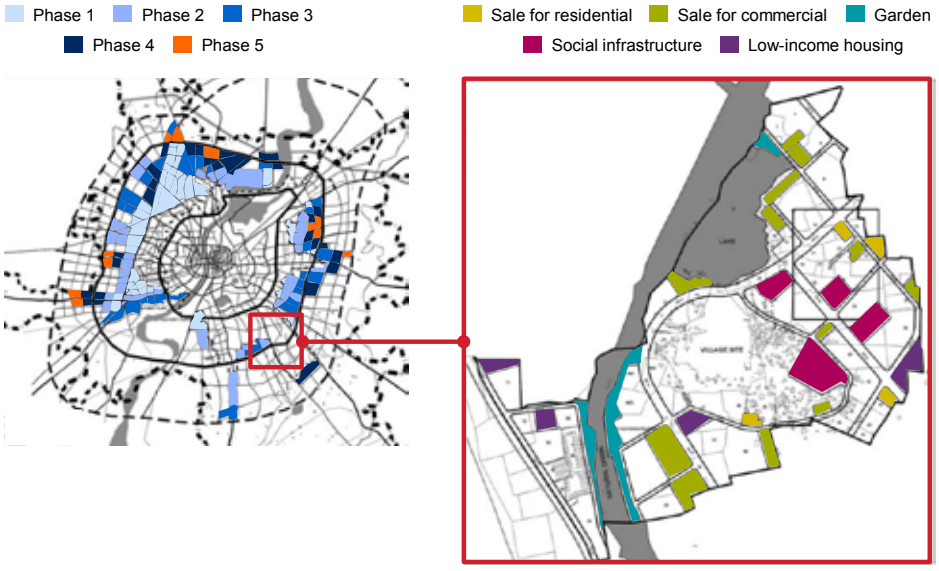
From 1999 to 2009, the Ahmedabad Urban Development Authority managed to develop about 700 hectares a year using the Town Planning Scheme, equivalent to about 3.2 percent of the current built-up area of Ahmedabad (Exhibit 25). The readjustment program has also been effective in developing primary infrastructure assets such as the Ahmedabad ring road.

Exhibit 25

Ahmedabad has expanded its built area by 3 percent a year through a town planning scheme

Sequence of town planning schemes in Ahmedabad Development Plan, 1999–2009

Developed on average ~700 hectares, equivalent to 3.2% of built area



SOURCE: Shirley Ballaney, *The town planning mechanism in Gujarat, India*, World Bank, 2008; McKinsey Global Institute analysis

Unlock land by formalizing informal settlements and registering unregistered land

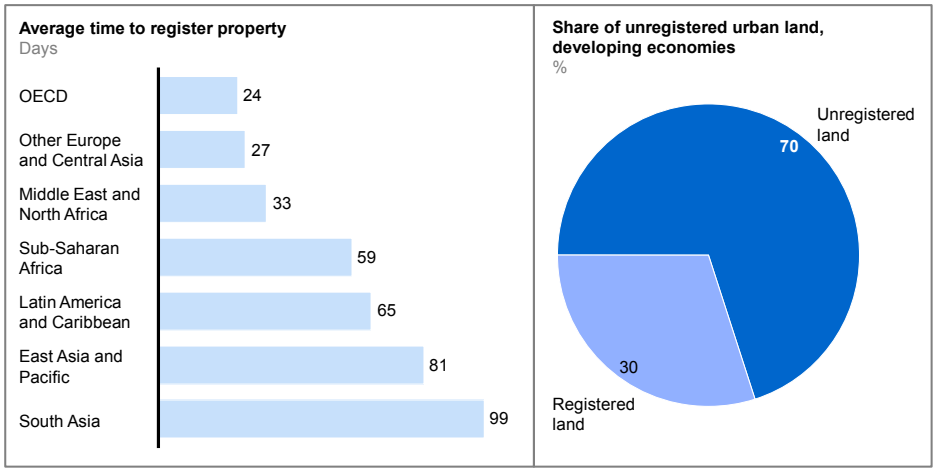
A major reason that land might not be used for development is that ownership rights are not properly established. This may be because of informal use, when squatters inhabit public or privately owned land, or may reflect the lack of an adequate land-registration system to show (or prove) who owns land. Formalizing informal settlements or customary tenure of land and creating a land-registry system are critical steps in unlocking developable land. Before investors or public authorities can consider developing new housing on a particular piece of land, they need absolute certainty of ownership and conformation to applicable laws and regulations.

In regions where formal land is not affordable for low-income households, many residents occupy public land illegally or build on land where construction is prohibited. These forms of occupancy frequently result in slums such as those in Mumbai or Rio de Janeiro. Formalization typically involves broad slum rehabilitation efforts with subsidies to provide quality housing at low prices. Land ownership can remain with public authorities, collectives or cooperatives, or individual parcels can be offered for purchase by households.

In many developing economies, efficient and reliable land registration and titling remain relatively uncommon and land is occupied according to indigenous and traditional community rules, without formal ownership mechanisms. In many cities in developing economies, two-thirds of urban land remains unregistered. On average, it takes three times as long to register land in Latin American, East Asian, and Pacific nations, and South Asia, as in Organisation for Economic Co-operation and Development (OECD) countries (Exhibit 26).

Exhibit 26

Slow land registration contributes to a high share of unregistered land, perpetuating informal use and blocking sales and development



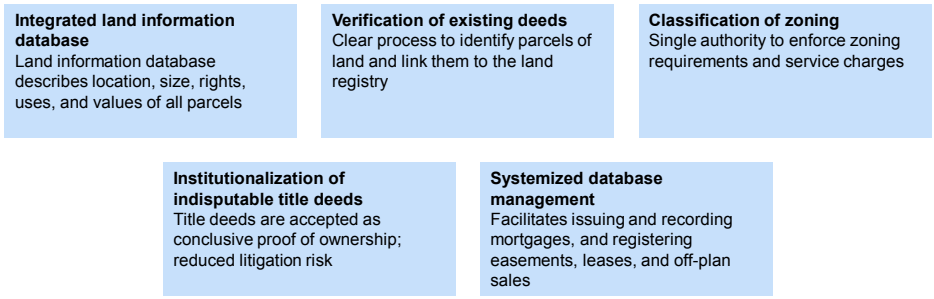
SOURCE: *Doing business 2014*, World Bank; *Housing the poor in African cities*, UN-Habitat and Cities Alliance, 2011; McKinsey Global Institute analysis

In developing economies, land has been transferred in many different ways, and in different cultures the issues of tenure and ownership are resolved by varying means. In Africa, land has traditionally been transferred informally, with tribal and village leaders allocating plots. As demand for land has risen in recent years, some land has been transferred formally through sales, but with only simple documentation, such as a notarized bill of sale.

Developing a land-registration system and legal framework to certify ownership and create clear titles can unlock land value. Owners can enter the formal market and use their land as collateral, expanding development opportunities in the market. In Peru, the government registered individual land titles of more than 1.2 million households.[49] But titling individual parcels also carries risks. In some instances, individual titling has opened communities to land speculation, and poor families have sold land for quick cash, eliminating their best chance to accumulate long-term wealth and reducing community stability.[50]

There are good global models for land-registration systems that can help unlock land for affordable housing. Best-practice land-registration systems have five common features: they have an integrated land information database, verify existing land titles, classify zoning, institutionalize indisputable title deeds, and systematize database management (Exhibit 27). The result should be a land-registration regime (also known as a cadastral system), in which the registered deed is recognized as conclusive proof of ownership, limiting the risk that previously unregistered rights can be asserted successfully and thus avoiding challenges to deeds and delays in development.

Exhibit 27
Five elements of an effective government land registration program


Integrated land information database
Land information database describes location, size, rights, uses, and values of all parcels
Verification of existing deeds
Clear process to identify parcels of land and link them to the land registry
Classification of zoning
Single authority to enforce zoning requirements and service charges
Institutionalization of indisputable title deeds
Title deeds are accepted as conclusive proof of ownership; reduced litigation risk
Systemized database management
Facilitates issuing and recording mortgages, and registering easements, leases, and off-plan sales

SOURCE: McKinsey Global Institute analysis

The foundation of a good land-registration system is a database that includes all relevant information about recorded properties. These data should include information about mortgages, easements, transfers, instruments, charges, leases, transmissions, writs and orders of court, powers of attorney and restrictive covenants, and any other information affecting ownership. All data should be tied to a single record for each property, and all information should be accessible online so that developers and investors can quickly understand what issues they might face if they acquire property and attempt to build or renovate.

49 "This land is your land: A conversation with Hernando de Soto," *World Policy Journal*, summer 2011.

50 M. Rutten, *Selling wealth to buy poverty: The process of the individualization of land ownership among the Maasai pastoralists of Kajiado District, Kenya, 1890–1990*, Verlag Breitenbach, 1992.

Critically, land-registry systems verify the validity of existing deeds, confirming that parcels of land exist as they are described in title documents and that deeds are accurately recorded in the land registry. To ensure certainty of title, a single authority should be responsible for submission of title deeds, confirmation of title deeds, and recording changes in title. In some countries, land-registration authorities require a purchaser to execute a title search (which may also be guaranteed by title insurance) to prove that the title is clear of liens, mortgages, and other encumbrances. In Australia, Canada, Singapore, the United Kingdom, and elsewhere, the validity of the deed is backed up by a compensation system; in case of errors, the land-registration authority will pay damages.

Effective land-registration systems also make clear how any parcel may be used, providing a single authority to identify which parcels are subject to which rules regarding height, density, permitted uses, and so on. Land-use agencies should conduct periodic updates and reviews of land-use laws and notify owners about charges. Land-use agencies are also responsible for granting variances and may negotiate with owners and developers to provide public improvements in return for permission to build non-conforming projects.

To meet the specific and pressing needs for assembling land for affordable housing in developing economies, land-registration systems should have strong mechanisms for registering previously unregistered land. One approach is to publish notice of the proposed deed for previously unregistered land and, if no one comes forward with a prior claim, the deed is deemed irreversible (pending whatever compensation the government and private-sector developers are required to make), to avoid lengthy delays from challenges to titles.

Adoption of a modern, comprehensive, and reliable property registry can have immediate beneficial effects. In Dubai, for example, the volume of land sales jumped by more than 80 percent, from an average of 180 per month to 330 per month, after reforms to the land-titling system were adopted. The government digitized records, required brokers to register, and simplified land-registration processes. It also created a secure database to ensure the reliability of records and created a public authority to oversee the real estate industry.

Reform urban land-use regulations with inclusionary planning elements

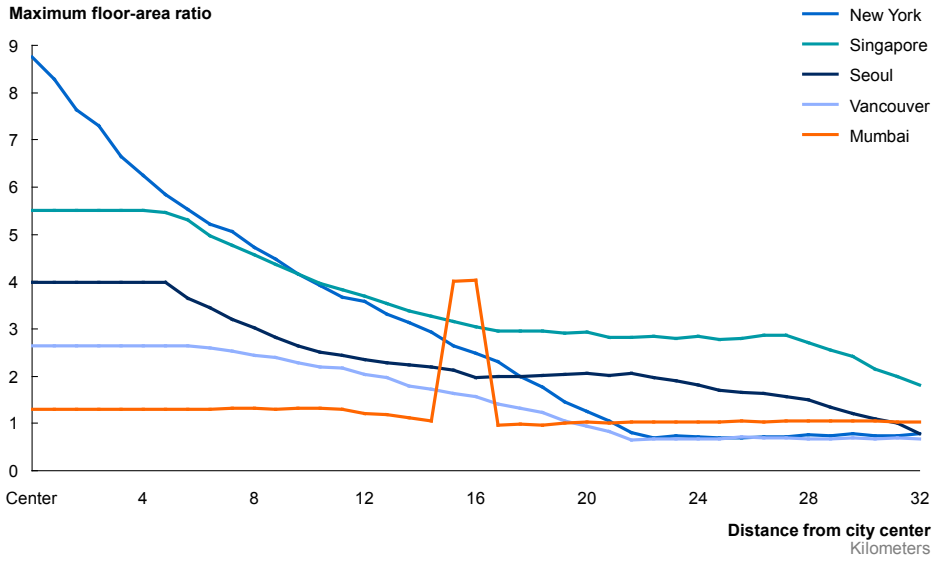
Cities typically restrict density of land use by imposing maximum floor-area ratios, minimum lot sizes, and open-space requirements. Comparison of some of the largest and densest cities reveals large differences in maximum density, even within these cities. Typically, density falls with distance from the city center. So, while Manhattan has some of the highest floor-area ratios in the world, the outlying boroughs of Queens and Staten Island have some of the lowest among major cities (Exhibit 28). Singapore has relatively high floor-area ratios across its area, while Mumbai has low floor-area ratios across the city except for variations in specific districts.

Density limitations are typically introduced in response to concerns about infrastructure capacity (like congested roads and rail lines) and other negative effects of new construction on current residents.[51] Where urban neighborhoods have sufficient infrastructure, amenities, and open spaces, an increase in density can greatly increase the supply of housing and help advance affordability.

Exhibit 28

Floor area ratios vary across cities and within metropolitan areas

Maximum floor-area ratio decreases with distance from city centers



1 Dharavi slum rehabilitation project with floor-area ratio of 4.
SOURCE: Alain Bertaud, *Mumbai's FSI conundrum*, 2002; World Bank; McKinsey Global Institute analysis

Increasing density puts more units on a plot of land, which reduces the cost of land per dwelling unit and allows more floor space at a given population density. Luxury apartment dwellers in a high-rise in Hong Kong might live on 4.5 square meters of land per person, less than the land used by slum dwellers in Ahmedabad (6.5 square meters per person) but with significantly more floor space.[52]

Too-stringent rules on land use force households in all income brackets to use more land than they would likely purchase at prevailing prices and reduce the affordability of housing for all. According to one analysis, after the city of Boston introduced regulations limiting land uses, the number of permits per acre fell by about 40 percent from 1980 to 2002, leading to constrained supply and higher housing prices.[53]

Seoul and Mumbai have very different approaches to floor-area ratios and very different results. Seoul adjusts floor-area ratios based on the location's proximity to metro stations and main streets. The ratios vary from 0.5 to 4.0 in residential

51 For an overview, see Christopher T. Boyko and Rachel Cooper, "Clarifying and re-conceptualising density," *Progress in Planning*, volume 76, 2011.

52 Bertaud, Alain, *Converting land into affordable housing floor space*, World Bank policy research working paper number 6870, May 2014.

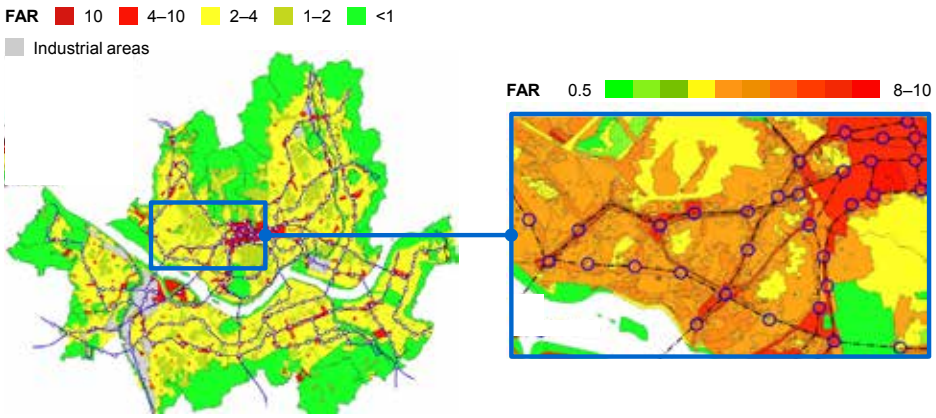
53 Edward L. Glaeser and Bryce A. Ward, "The causes and consequences of land use regulation: Evidence from Greater Boston," *Journal of Urban Economics*, volume 65, number 3, May 2009.

areas and from 8.0 to 10.0 in the central business district and major subcenters (Exhibit 29). Floor-area ratios in Mumbai range from 0.5 to 2.0, except in Dharavi, where higher density has been allowed for slum rehabilitation. Mumbai's ratios do not reflect important variations, such as difference in accessibility around train stations, the difference between commercial and residential areas, or variation in land values. Mumbai's land-use regulations unnecessarily restrict further development and densification, which has implications for housing shortages and prices.[54]

Exhibit 29

Seoul increased density in the vicinity of metro stations and main streets

Floor area ratio (FAR) zoning in Seoul



SOURCE: Alain Bertaud, "Options for new alternatives for development control regulation and justification for increasing FSI," April 2008; McKinsey Global Institute analysis

Cities can adjust floor-area ratio rules at a block level, taking into account spatial distribution of housing, infrastructure capacity, and demand for land for various uses within the city. This allows for a market-based approach for land and floor-space regulation. Cities can also adjust regulations setting open space requirements, minimum lot sizes, building heights, or parking requirements to alter land use. These adjustments can be used to increase land use, particularly in areas close to transit stations where the infrastructure can support it, and reduces house prices for all by increasing supply of housing for residents at all income levels. And as new supply is occupied, older housing becomes available in appropriate locations for low-income households.

For a dynamic floor-area ratio system to succeed, new density patterns must align with infrastructure capacity. Bangkok experienced unwanted consequences after the city set floor-area ratios at 10.0 across the city in the 1970s. Developers responded by building high-density communities that replaced the older housing stock, and an entire generation of relatively affordable housing was created. However, the new density was far beyond the capacity of the road infrastructure, leading to massive congestion by the late 1990s. These high floor-area ratio levels were reviewed and regulated in the early 2000s.

54 Alain Bertaud,, *Mumbai FSI conundrum: The perfect storm—the four factors restricting the construction of new floor space in Mumbai*, www.alainbertaud.com, 2004.

In the near term, broad land-use reform that is aimed at increasing development needs to be complemented with inclusionary measures to ensure that neighborhoods can accommodate residents at different income levels. In many instances, reforms to increase densities or upgrade housing standards have had exclusionary effects—displacing existing residents who are unable to afford the new housing and are forced to leave both their homes and their social networks (see Box 3, "Redevelopment without inclusionary principles: Displacing low-income tenants").

Box 3. Redevelopment without inclusionary principles: Displacing low-income tenants

Lower-income residents are displaced both when individual buildings are upgraded and when, through up-zoning, more expensive high-density buildings are introduced, a common phenomenon in inner-city redevelopment.

Beirut provides an extreme example. Battered by 16 years of civil war, the Beirut central district was badly in need of upgrading. An effort led by a joint-stock company brought in $2 billion of direct investment that has created a modern, 191-hectare mixed-use central district with new infrastructure. However, in the process, central Beirut became one of the costliest neighborhoods in the city, with only high-end luxury housing.

In Vancouver, the city council increased height allowances to meet demand from a rapidly rising population, as Vancouver became a magnet for Asian immigrants. High-rise luxury residential buildings with spectacular views quickly rose, and property values soared to levels difficult for most to afford.

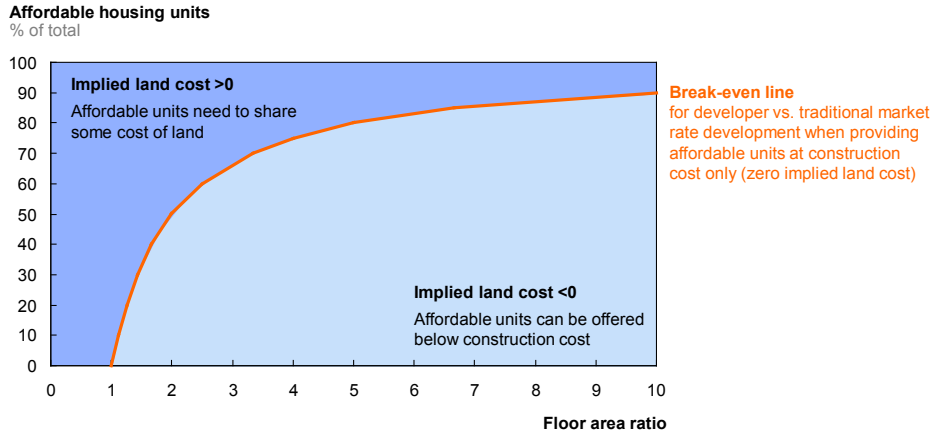
If cities manage land-use reforms to increase density well, they can make an enormous contribution to efforts to narrow the affordable housing gap. Increasing the floor-area ratio of a plot of land raises the potential income from development and, overnight, the value of the land rises. This value can be used to cross-subsidize affordable housing. Indeed, with well-calibrated inclusionary zoning rules and negotiations with builders, land can be made available at virtually any cost that is needed to make housing affordable (Exhibit 30).

Exhibit 30

Under the right conditions, land for affordable units can be supplied at almost any desired price point

ILLUSTRATIVE

Developer economics by floor-area ratio and share of affordable units[1]



1 Assuming the following cost breakdown: 50% land price, 40% construction cost, 10% margin, and affordable housing sold at 50% of market price.

SOURCE: McKinsey Global Institute analysis

Three mechanisms can encourage use of higher-density urban land for affordable housing: offer density bonuses that allow developers to build more units on a property (and capture some of the increased value for affordable housing), mandate affordable housing through inclusionary zoning, and offer transferrable development rights (which allow developers to fulfill their obligation to provide affordable units on a different site). Each of these approaches is essentially a tax on housing construction for higher-income residents that acts as a cross-subsidy to build affordable housing for lower-income citizens. The risk of these programs is that they skew markets and introduce arbitrage opportunities for developers and owners. Therefore, they must be implemented with great care. Nonetheless, they have been used successfully to provide lower-cost housing.[55]

- **Density bonus.** New York City has created zones in which developers can build 33 percent more space on a given plot of land (by building more floors) if they set aside 20 percent of units as affordable housing. Developers essentially get free land for the affordable units and for a share of their market-rate units. In California, developers typically are required to devote 10 percent (of original floor space) to affordable units against an equivalent density bonus of 10 percent.[56]

  The density bonus is also a common tool for slum redevelopment. Developers obtain rights to develop parts of the slum area as high-value commercial or residential property, in return for providing free housing to displaced slum dwellers on the site. This can be an attractive proposition in cities such as Mumbai, where large slums sit on desirable land (see Box 4, "Slum rehabilitation").

- **Inclusionary zoning.** In some places, inclusionary requirements are imposed on all developments, through zoning rules or negotiated rights. In Spain, for example, 30 percent of floor-area in any residential development must be reserved for affordable housing. In the United Kingdom, local housing authorities have the right to share the benefits from development gains. In London, the Imperial Wharf redevelopment was approved on the condition that 525 of the 1,065 residential units would be affordable.[57]

  In Barcelona, "La Marina," a 143-hectare brownfield site near the city center, is set to be redeveloped with an inclusionary density bonus approach. The developer was asked to fund most of the required infrastructure additions, compensate owners for the value of existing buildings and land, donate part of the land for public uses, and provide half of all residential units at affordable rates (around one-third of market prices). Even so, by increasing the floor-area ratio from 1 to 2.3, the business case worked out, and the project is to include 6,000 affordable and 6,000 market-rate units (Exhibit 31).[58]

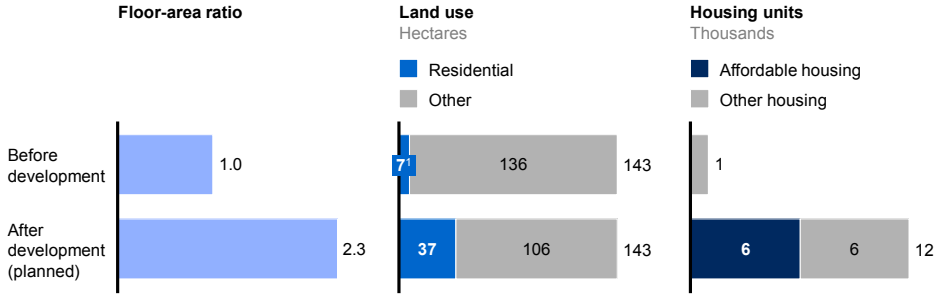
55 See also Antonio Bento et al., "Housing market effects of inclusionary zoning," *Cityscape*, volume 11, number 2, 2009.

56 Nico Calavita and Alan Mallach, eds., *Inclusionary housing in international perspective: Affordable housing, social inclusion, and land value recapture*, Lincoln Institute of Land Policy, July 2010.

57 Ibid.

58 Ibid.

Exhibit 31
By raising density, land for affordable housing can be provided



1 Calculated based on number of housing units, with a floor-area ratio of 1, unit size 78 square meters (average size in Barcelona).
SOURCE: Nico Calavita and Alan Mallach, eds., *Inclusionary housing in international perspective*, Lincoln Institute of Land Policy, July 2010; Barcelona City Council; McKinsey Global Institute analysis

- **Transferable development rights.** Some cities issue transferrable development rights that allow developers to build the required affordable units on a different site, usually on a less valuable property. The city of Bogotá, Colombia, allows developers to meet the nationwide requirement to set aside 25 percent of units for affordable housing in inner-city areas by substituting land in less expensive alternative sites.[59] And two-thirds of communities in California allow developers to apply to build required affordable units off-site.

  Transferable development rights are widely used in the United States to facilitate densification and conserve land—sometimes to encourage the construction or preservation of affordable housing. In Seattle, owners of affordable housing units can earn transferrable development rights by promising to keep those units affordable for 50 years. The rights can be transferred among developers, but the city encourages developers to use them within the same block where they were earned to ensure diversity in development and social inclusion.[60]

  To help fill a housing shortage of an estimated one million units, Rajasthan, the largest state in India, launched a program in 2009 to offer a density bonus with transferable development rights to private developers on private land. In return for devoting at least 40 percent of units to housing for low-income segments (which are sold to the government at a pre-determined price), the government allows the developer to double the floor-area ratio on the site where the bonus is earned or on another site.[61]

59 Nico Calavita and Alan Mallach, eds., *Inclusionary housing in international perspective: Affordable housing, social inclusion, and land value recapture*, Lincoln Institute of Land Policy, July 2010.

60 Garrett Milam et al., *Analysis of the impacts of transferable development rights programs on affordable housing*, Cascade Land Conservancy, May 2009.

61 H. S. Sancheti, "Policy of transferable development rights in Rajasthan," *India Journal*, volume 8, number 2, April–June 2011; *Affordable housing policy 2009: Jaipur development*, Jaipur Development Authority, 2012.

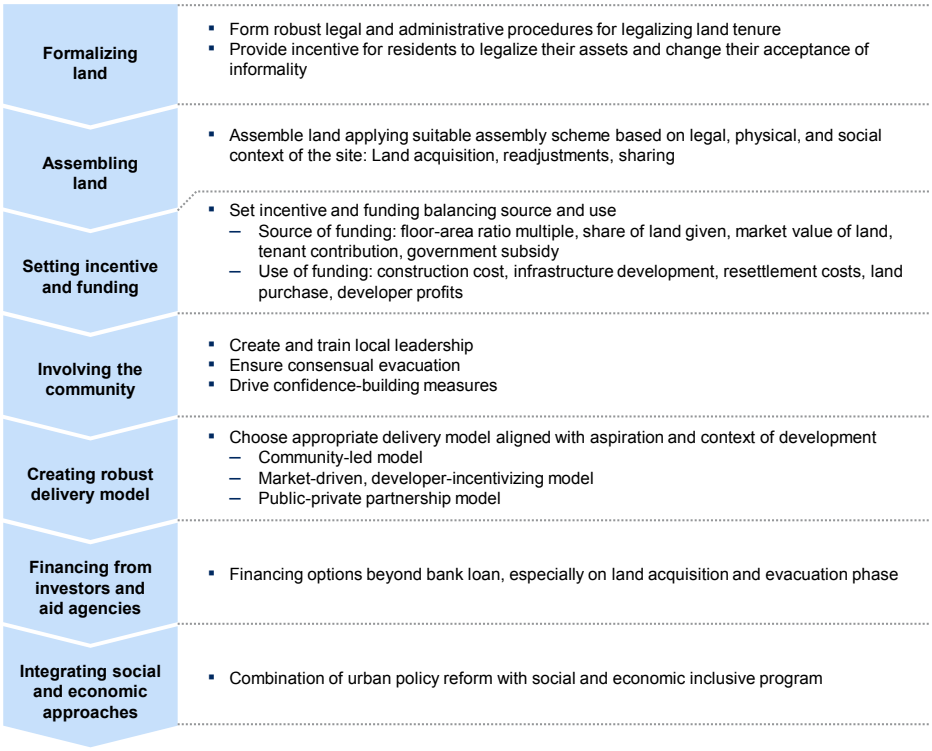
Implementation of density bonus schemes and related redevelopment plans requires great care, particularly in striking the right balance between the cost of affordable units and the value gained by the developer. If incentives are too low, development of affordable units stalls. Density bonus programs are also subject to abuse; developers have provided low-quality affordable units, placed them in unattractive locations, or converted affordable units to market-rate units. These programs require strong enforcement and monitoring by government authorities. Such incentives also need to be structured with clear milestones and conditions and obligations, which trigger the release of the incentives.

Box 4. Slum rehabilitation

An estimated one billion people around the world live in slums or in substandard housing. In developing economies, sprawling communities have grown on unregistered and poorly serviced land. Less than 25 percent of slum dwellers have access to clean drinking water, and less than 20 percent live in places with sewage systems or garbage collection. There have been many efforts around the world to rehabilitate such slums, replacing shacks and dilapidated housing with well-built, decent homes and creating new communities. These programs follow seven steps (Exhibit 32).

Exhibit 32

Successful slum rehabilitation involves seven steps


Formalizing land
Form robust legal and administrative procedures for legalizing land tenure
Provide incentive for residents to legalize their assets and change their acceptance of informality
Assembling land
Assemble land applying suitable assembly scheme based on legal, physical, and social context of the site: Land acquisition, readjustments, sharing
Setting incentive and funding
Set incentive and funding balancing source and use
– Source of funding: floor-area ratio multiple, share of land given, market value of land, tenant contribution, government subsidy
– Use of funding: construction cost, infrastructure development, resettlement costs, land purchase, developer profits
Involving the community
Create and train local leadership
Ensure consensual evacuation
Drive confidence-building measures
Creating robust delivery model
Choose appropriate delivery model aligned with aspiration and context of development
– Community-led model
– Market-driven, developer-incentivizing model
– Public-private partnership model
Financing from investors and aid agencies
Financing options beyond bank loan, especially on land acquisition and evacuation phase
Integrating social and economic approaches
Combination of urban policy reform with social and economic inclusive program

SOURCE: McKinsey Global Institute analysis

Often, the first step is to gain formal rights to the land underlying slum areas and find additional land for modern development. Thailand launched the Baan Mankong (Secure Housing) program in 2003 and encouraged communities to come together to negotiate with landowners to regularize the status of slum property. Groups have secured long-term leases of public land, assumed collective ownership of private land, and gained permission to use land that they occupy. By 2011, 800 projects were completed or under way, benefiting about 300,000 poor families. In Turkey, to assemble land for its *gecekondu* slum upgrading program in 2003, the TOKİ housing agency acquired land for development by authority, temporarily settled occupants of existing slums, then resettled them in new homes.

Box 4. Slum rehabilitation (continued)

To enlist developers in slum rehabilitation schemes and persuade them to pay for land, construction, infrastructure, and relocation costs, governments typically offer large incentives. In India, the Dharavi Redevelopment Project is taking on the massive job of rehabilitating the slum of Maharashtra, the most crowded slum in Asia, with around 800,000 inhabitants living on about two square kilometers of land. To accelerate redevelopment, the state housing authority is allowing developers to build at three times the density normally allowed in the area. In addition, for every 100 square feet of free housing for slum dwellers, the builders have the right to build 133 square feet of market-rate housing.[1]

To succeed, rehabilitation plans should have full participation of the community in planning and execution in order to build popular support and enable consensual evacuation. Since 1999 in Bangladesh, the Local Partnerships for Urban Poverty Alleviation Project has been building capabilities among leaders of poor urban communities and involving local institutions in project design, implementation co-management, and local governance.

Rehabilitation projects can be led by government, developers, or the community. The Baan Mankong program in Bangkok applies a community-led approach, in which the community makes decisions about infrastructure and housing construction, and the government provides subsidies directly to residents. From its launch in 2003 to 2011, the program helped build 90,000 units in 1,546 communities.[2] The homes were built at lower cost and on a shorter timeline than typical top-down projects. In Dharavi, the Mumbai Slum Rehabilitation Authority set incentives for developers and specified the qualifications developers needed. TOKİ used a public-private partnership for slum redevelopment in Turkey.

Slum rehabilitation is a large-scale, lengthy, and costly process, involving land acquisition and evacuation. Therefore, these projects require more than conventional real estate financing. In the *Minha Casa Minha Vida* (My House My Life) program in Brazil, the government put up non-refundable financing, a refundable fund was provided by the Workers Severance Fund, or *Fundo de Garantia do Tempo de Serviço*, and refundable financing also came from the Brazilian Development Bank.[3]

Finally, since housing is only part of the challenge facing the urban poor, slum rehabilitation programs must be integrated with other social, infrastructure, and economic initiatives. In Manaus, Brazil, more than 6,000 families were resettled in a relatively short period of time with the assistance of Prosamim (Social and Environmental Program for the Igarapés in Manaus). The program focused on the re-establishment of economic activities for people displaced by resettlement through compensation, credit, and job and entrepreneurial training, which was available to individuals or through associations. The authority also allowed the establishment of shops on the ground floors of the rehabilitated blocks to accommodate commercial businesses that had existed prior to resettlement, helping restore the micro economies that existed within the slums.

1 Benita Fernando, "An urbanist's guide to the Mumbai slum of Dharavi," *The Guardian*, April 2, 2014.

2 Nattawut Usavagovitwong, *Successful approaches to national slum upgrading and prevention, Thailand*, Center for Integrated Socio-Spatial Research Housing Study Unit, working paper number 7, June 2012.

3 *Scaling-up affordable housing supply in Brazil: The My House My Life program*, United Nations Human Settlements Programme, 2013.

An industrial approach is essential to deliver housing quickly, on a large scale, and at the desired cost

The affordable housing challenge has been complicated by the limitations of the global construction industry. Simply put, it costs too much and takes too long to build housing, restricting supply of affordable housing and contributing to the growing affordable housing gap. Even if land is available and proper incentives and financing mechanisms are in place, the global affordable housing gap cannot be filled unless inefficiencies in construction can be addressed.

Fortunately, there is significant room for improvement in the construction industry, and there are clear ways to achieve it. While manufacturing and other industries have raised productivity steadily in the past few decades, construction productivity has remained flat or is down in most countries. In many places, residential housing is built in the same ways it was 50 years ago. By using value engineering and an industrial approach to home building (standardizing design elements and using prefabricated component manufactured off-site, for example), and by adopting efficient procurement methods and other process improvements, project delivery costs can be reduced by about 30 percent and completion schedules can be shortened by about 40 percent.

TO MEET GROWING DEMAND FOR AFFORDABLE HOUSING, A MASSIVE INCREASE IN CONSTRUCTION CAPACITY WOULD BE NEEDED

To meet the projected need for affordable housing in 2025, nations around the world will need to find ways to accelerate supply. In the 20 largest cities in the world, an estimated 2.4 million housing units per year will be added (Exhibit 33). About three-quarters of these new urban households will be in developing economies where population growth is fastest. But slow additions to supplies of affordable housing widen the affordability gap even where population growth is relatively slow. In the United States, for example, construction of affordable housing has already fallen behind demand (Exhibit 34). While the population living in households earning less than half of area median incomes has grown faster than in most other cohorts, virtually no affordable housing has been built for these people.

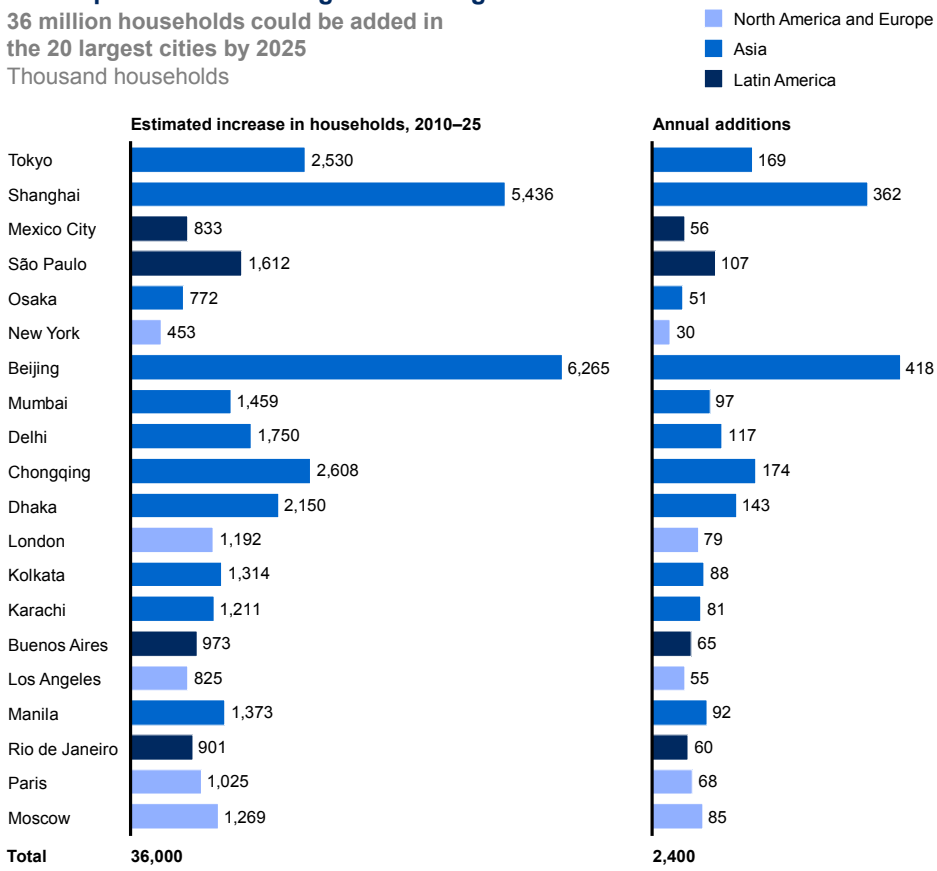
Construction costs are the largest factor in affordable housing costs. We estimate that a standard unit in a multifamily building needs to be delivered at a cost of $150 to $1,500 per square meter (depending on the country) to be affordable for households earning 80 percent of the area median income. This implies that construction costs would need to be reduced by 30 to 50 percent compared with current costs to deliver affordable housing for this segment at prevailing land prices.

Exhibit 33

A significant increase in housing construction will be needed to keep up with expected household growth in large cities

36 million households could be added in the 20 largest cities by 2025

Thousand households



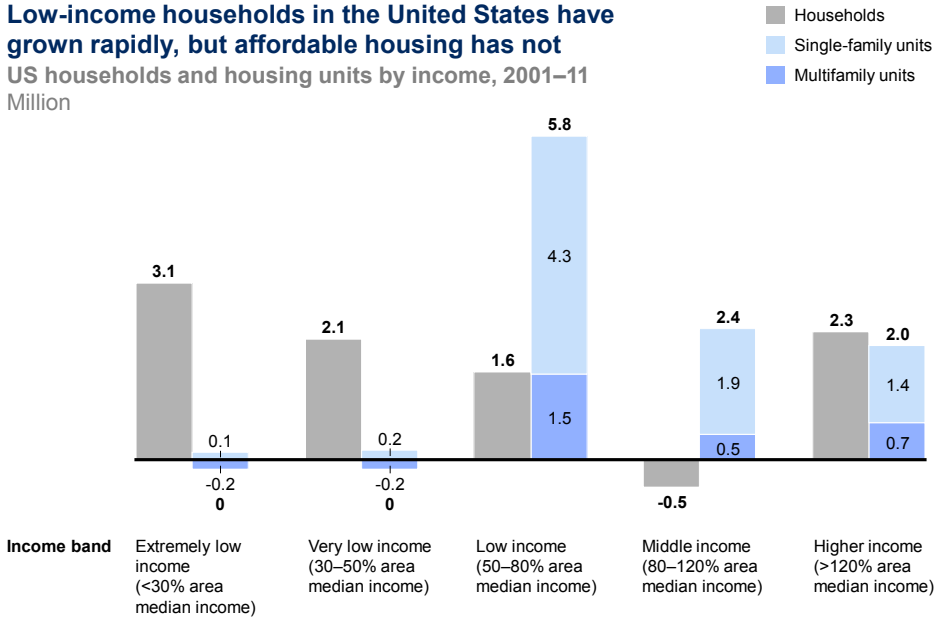
NOTE: Not to scale. Numbers may not sum due to rounding.
SOURCE: McKinsey Global Institute Cityscope database; McKinsey Global Institute analysis

Exhibit 34

Low-income households in the United States have grown rapidly, but affordable housing has not

US households and housing units by income, 2001–11

Million



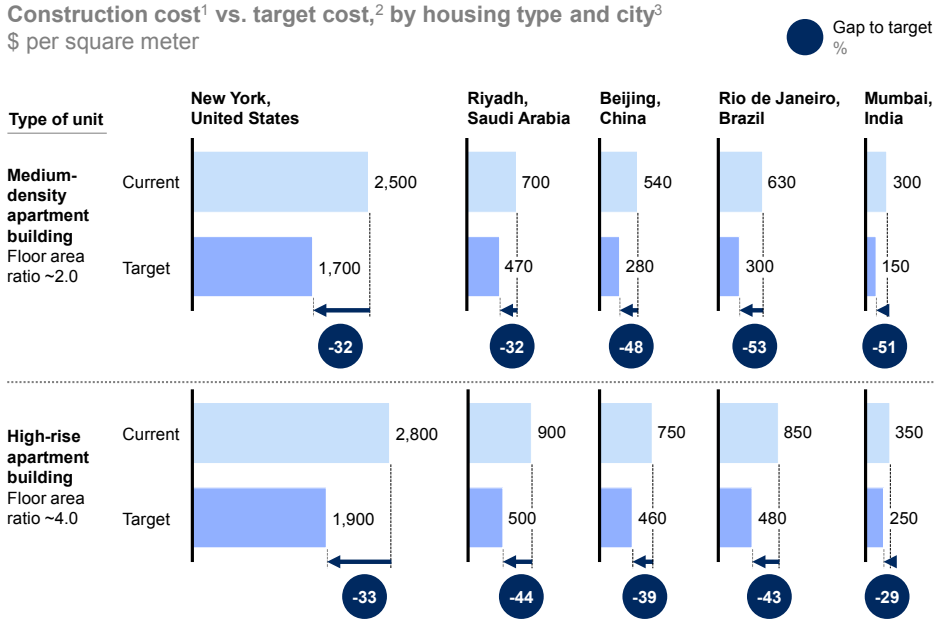
NOTE: Numbers may not sum due to rounding.
SOURCE: US Department of Housing and Urban Development; McKinsey Global Institute analysis

As Exhibit 35 makes clear, construction costs vary widely around the world. Some of the largest percentage-point improvements would be needed in places such as India, where our model yields the $150 per square meter target. Indeed, this cost is still an aspiration that has not been achieved on a large scale; there are few precedents for housing construction costs below $200 per square meter. However, hitting this cost target would be necessary in many low-income emerging nations in South Asia and sub-Saharan Africa. Therefore, entirely new approaches may be required to realize needed construction cost savings without compromising quality.

Exhibit 35

To build affordable housing, construction costs would need to fall by about a third in advanced economies and by up to half in developing ones

Construction cost[1] vs. target cost,[2] by housing type and city[3]
$ per square meter



1 Current market cost of construction by building type.
2 Target cost of construction, assuming 30% of 80% median income affordability definition.
3 Land cost based on 2013–14 land transaction prices, assuming low end of price spectrum typical for affordable housing; expert adjustments included.
NOTE: Numbers may not sum due to rounding.
SOURCE: Turner and Townsend; Gardiner and Theobald; Economist Intelligence Unit; McKinsey Global Institute Cityscope database; McKinsey Global Banking Pools; World Bank; UBS Prices and Earnings Report 2012; expert interviews; McKinsey Global Institute analysis

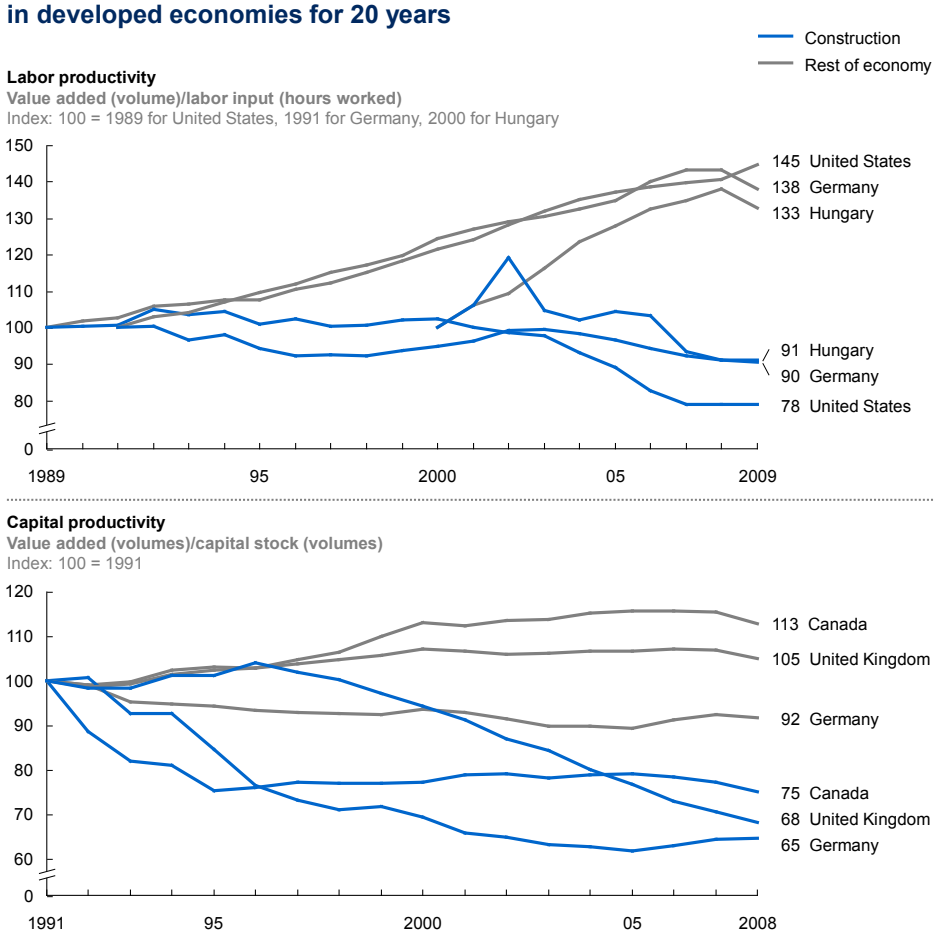
THE HOUSING CONSTRUCTION INDUSTRY FACES A PRODUCTIVITY IMPERATIVE

Around the world, construction costs are driven by three major factors: poor productivity, rising labor costs, and the unpredictable prices of commodities. In many places the productivity revolution of the past three decades has bypassed the construction industry. The United States, the United Kingdom, and Hungary, for example, raised labor overall productivity by 33 to 45 percent from 1989 to 2009. However, in their construction industries, labor productivity fell by 10 to 22 percent during the same period (Exhibit 36).[62] Capital productivity is also limited in construction compared with other industries, but the gap is less than in labor productivity.

62 For productivity barriers in the construction industry, see also Martin N. Baily and Robert M. Solow, "International productivity comparisons built from the firm level," *Journal of Economic Perspectives*, volume 15, number 3, summer 2001.

Exhibit 36

Labor and capital productivity in construction have been falling in developed economies for 20 years



SOURCE: OECD Stat; McKinsey Global Institute analysis

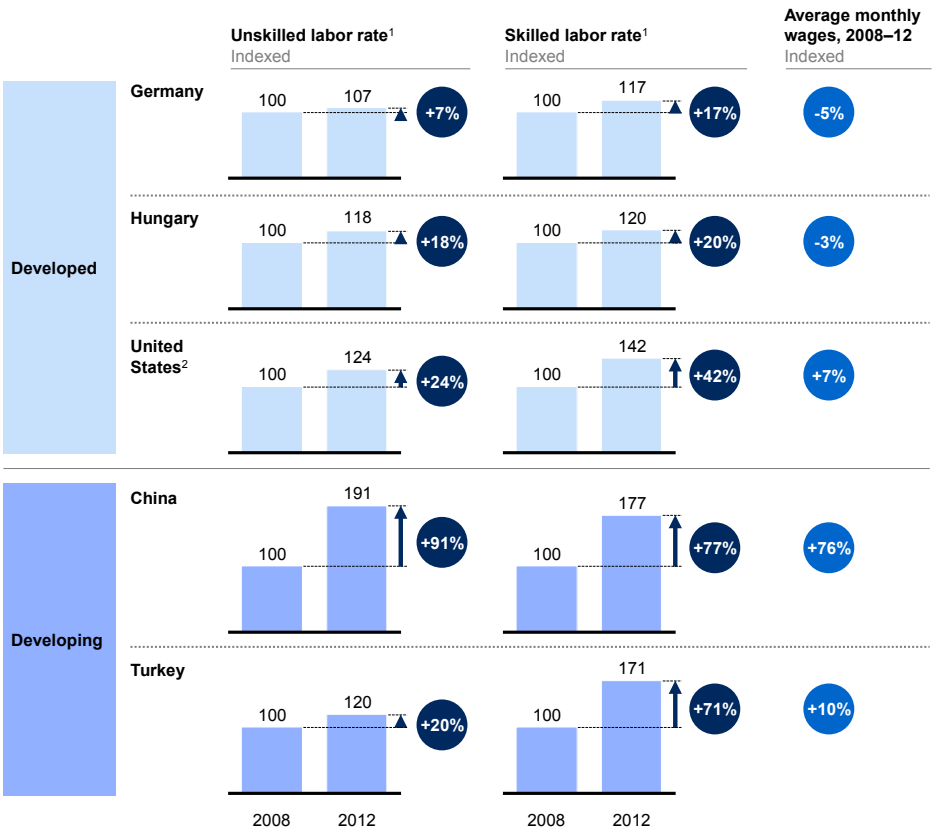
There are many reasons for stagnant or declining productivity in construction. Both in advanced and developing economies, construction industries tend to be highly fragmented. Typically, the industry has a large number of small companies that lack sufficient scale and capital. They operate on thin margins and have little capital to invest in equipment, technology, or training. Often, construction firms do not retain full-time employees and cannot compete for the most skilled workers when they need crews. Also, without a capital cushion, small firms are not resilient to the industry's boom-and-bust cycles. These factors contribute to widespread risk aversion, limited willingness to put money into equipment or other productivity-enhancing investments, and a reluctance to adopt new technologies. As a result, the industry has been slow to innovate, and when innovations have been adopted they have not been shared across the industry.

Meanwhile, using traditional construction methods is increasingly expensive. Labor rates, especially in developing economies where construction is extremely labor-intensive, continue to rise. Between 2008 and 2012, real labor rates of both skilled and unskilled labor in the construction industry increased in both developing and advanced economies faster than average wages (Exhibit 37).

Exhibit 37

Labor rates in construction have been rising faster than other wages

Surveyed labor rates in the construction sector are growing faster than real average wages, indicating a shortage



1 Based on total billing rate per hour in local currencies.
2 Based on average of Los Angeles, New York, and Seattle.

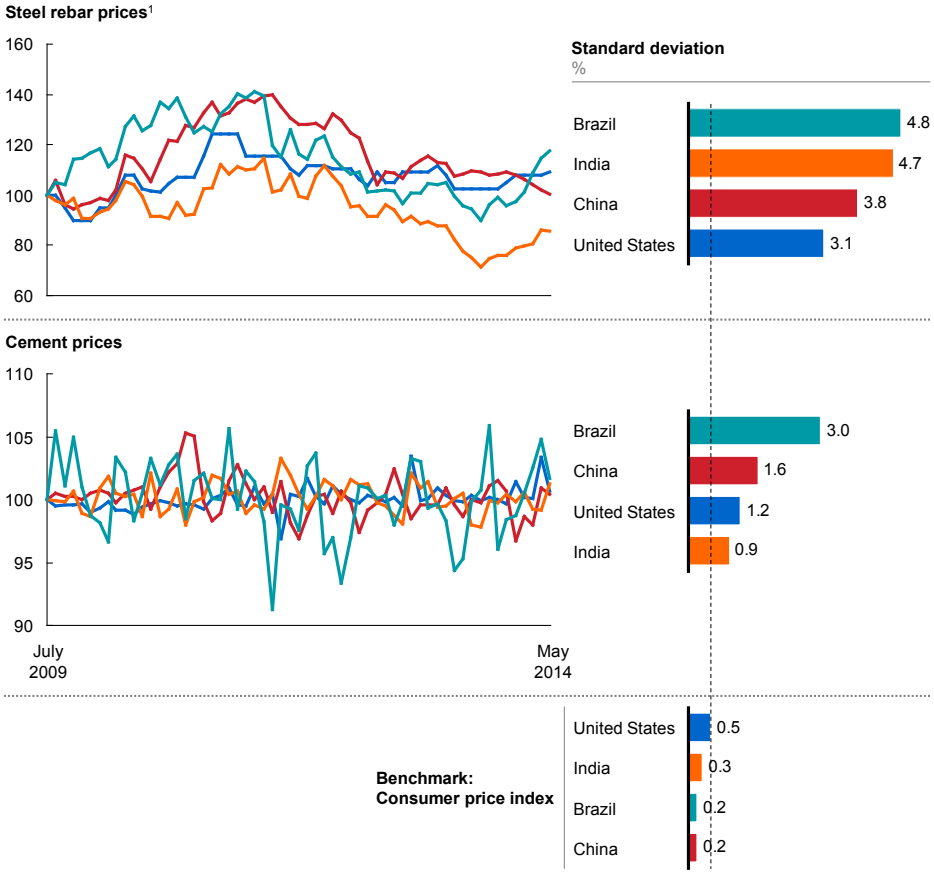
SOURCE: Gardiner & Theobald; International Labour Organisation; OECD Stat; Economist Intelligence Unit; McKinsey Global Institute analysis

In traditional construction, which can take years, movements in prices for materials pose a significant risk (Exhibit 38). The gap between ordering and delivery of materials can be several months, during which time prices of steel, cement, and other commodities can move against the developer. Since builders of affordable housing in developing economies typically have operating margins of 15 to 20 percent, a swing of 10 to 20 percent in prices can cut margins on affordable housing projects by one-third. This suggests the need for a new approach to procurement.

Exhibit 38

Smart procurement approaches are particularly important in the face of commodity price volatility

Volatility of steel and cement in key affordable housing markets, July 2009–May 2014
Index: 100 = July 2009



1 Steel rebar is one type of steel frequently utilized in construction.

SOURCE: MEPS; US Geological Survey; India Labor Bureau; Brazilian Chamber of Construction; India Cement Industry Association; China National Bureau of Statistics; International Monetary Fund data; Haver Analytics; McKinsey Global Institute analysis

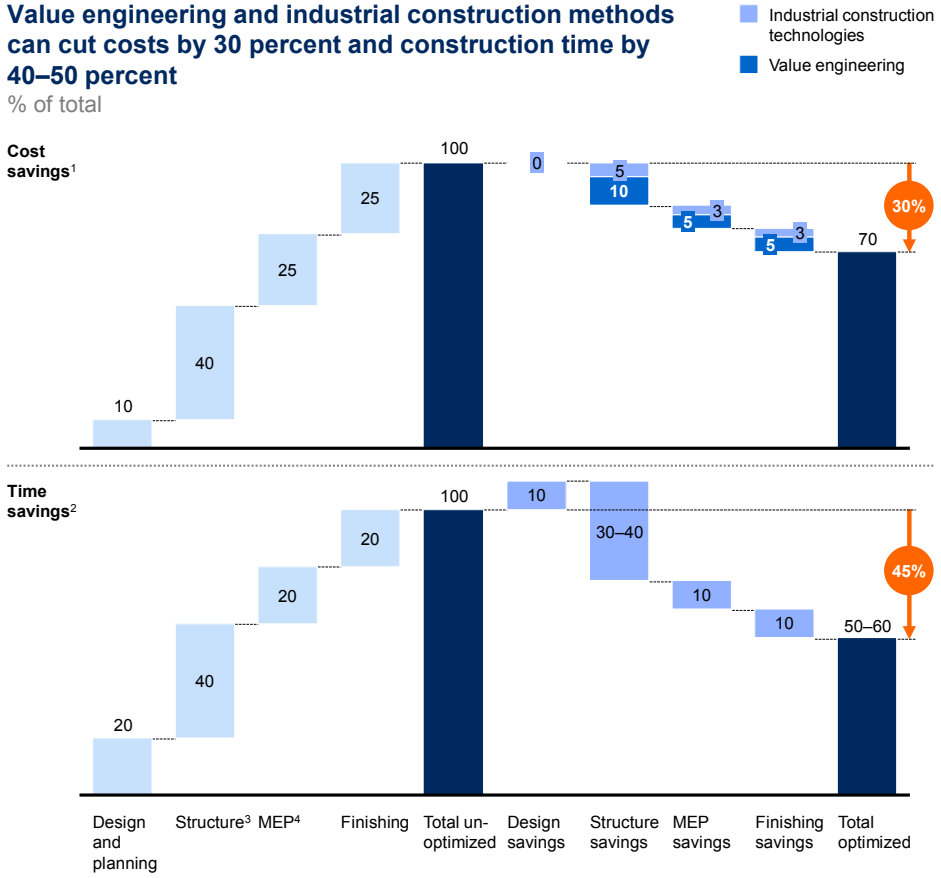
VALUE ENGINEERING AND INDUSTRIAL CONSTRUCTION METHODS CAN CUT COSTS BY ABOUT 30 PERCENT AND DELIVERY TIME BY 40–50 PERCENT

There are two main ways to reduce the time and cost of housing construction in order to produce affordable housing on the scale required. Value engineering is an approach that involves money-saving designs, efficiencies in procurement, and “lean” processes. Industrial approaches to construction can produce additional savings in cost and time. The combination of these methods can reduce costs by about 30 percent and time to completion by 40 to 50 percent (Exhibit 39).

Exhibit 39

Value engineering and industrial construction methods can cut costs by 30 percent and construction time by 40–50 percent

% of total



1 Based on typical medium-density affordable housing development cost breakdown.
2 Based on 36-month baseline schedule.
3 Includes foundation, superstructure, and landscaping.
4 Mechanical, electrical, and plumbing.
NOTE: Numbers may not sum due to rounding.
SOURCE: Expert interviews; McKinsey Global Institute analysis

Achieving cost and speed improvements to deliver affordable housing on a large scale will require, above all, a shift in mindsets. Incumbent construction companies are typically slow to change methods and processes, think of alternative approaches, or integrate efforts across the value chain (collaborating with subcontractors to improve processes, for example). Traditional construction management is geared to on-site activities, which stands in the way of integration of know-how across the value chain and comprehensive planning. Instead, companies stick with existing processes and manage every step sequentially, as they have always done. Changing this behavior will require investment in new capabilities as well as in tools and technology. Industrial methods also require transparency across the construction value chain: for example, subcontractors and suppliers need to see into the builder's scheduling and design systems for the latest updates. To realize potential productivity gains—and ultimately to remain competitive—construction industry managers will need to embrace transparency both internally and externally, within the organization and with suppliers and customers.

Capital productivity improvements, including value engineering, can reduce costs by 20 to 30 percent

Applying the principles of value engineering and introducing capital productivity measures have proven to be effective ways for construction companies to lower costs, shorten construction schedules, and improve labor productivity within housing projects. Three approaches are typically used in capital productivity efforts: design-to-value, purchasing excellence, and lean production and execution (Exhibit 40).

Exhibit 40

Capital productivity strategies can cut costs by 20 to 30 percent

Overview of capital productivity: main cost reduction levers

Design-to-value	Purchasing excellence	Lean production and execution
▪ De-specification of structural design, avoid over-specification of non–value-added components ▪ Standardization of micro-design: identify substitutes and use design-to-cost to set specifications	▪ Determine sourcing strategy for each category of construction activity, adapt subcontractor management ▪ Commercial optimization – Increase volume through bundling and purchasing practices – Use low-cost country sourcing ▪ Technical optimization: standardize and identify substitutes with advanced costing tools	▪ Pre-manufacturing: build components off-site using industrial processes, deliver parts as needed ▪ Planning optimization: apply critical-path management techniques to optimize overall plan; translate into realistic scheduling ▪ On-site lean execution: use lean techniques to standardize procedures that eliminate waste in individual activities and improve construction flow balancing ▪ Process step productivity: eliminate low value-added activities and wasted time to optimize process efficiency

SOURCE: McKinsey Infrastructure Practice; McKinsey Global Institute analysis

Using design-to-value to reduce cost and improve scale efficiencies

How a project is designed can determine how cost-effectively it can be built. The typical sources of inefficiency in residential building design are over-specification leading to an overbuilt design, use of costly features that do not contribute to the resident's experience, and design choices that do not permit standardization. Designing without taking advantages of opportunities to standardize is a common and costly error. For example, a recent comparison of about 100 residential projects of a leading European construction company showed that the gap between the lowest and highest ceiling heights and staircase-area-to-floor-area ratios was 40 to 45 percent. The design-to-value approach avoids these costly design choices.

The starting point for a design-to-value exercise for an affordable housing project is the site analysis and master plan. Since affordable housing projects are highly sensitive to land costs, the site analysis is a critical step in acquiring parcels that can make the project viable. A few key considerations affect the land development costs of a land parcel: a site profile needs to be produced, detailing the topography, soil conditions, elevation, slope, watershed, and impediments (rocks, underground streams, steep grades) that would have design implications such as the extent of retaining walls, drainage network design in terms of water-flow and catchment points, and other items that would raise costs. A careful study of the contours of the land parcel can help design the infrastructure

more efficiently and manage costs. For example, a leading affordable housing developer in India estimated that a difference in site gradient of 3 percent vs. 0.5 percent can increase the secondary infrastructure costs by 60 percent.

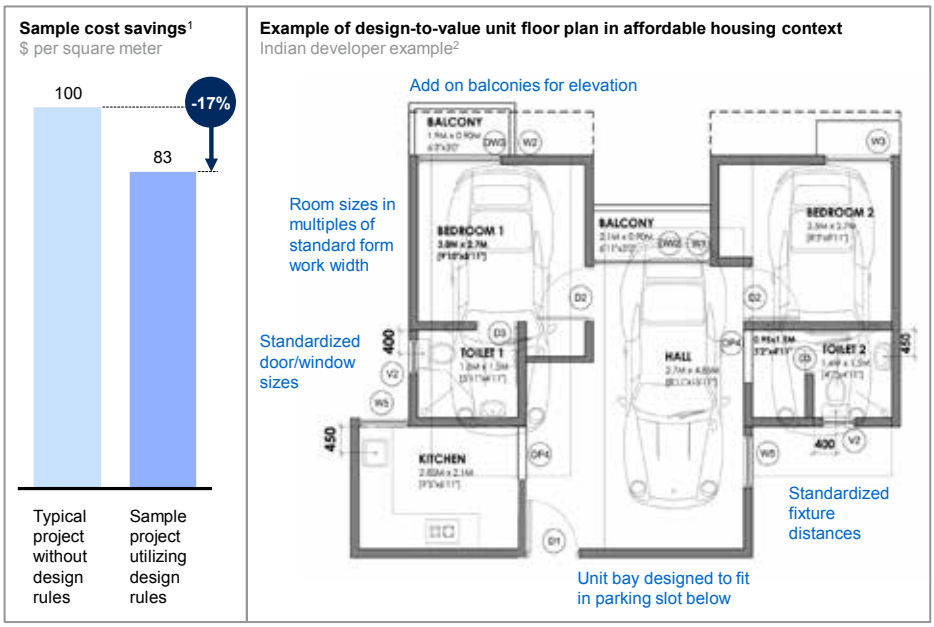
The design of the master plan is typically customized for each project since housing projects are located on different types of sites with varying conditions, shapes, and sizes. Further, the floor-area ratio limits in the area, substructure conditions, and parking needs will affect the master plan layout. However, where uniform specifications are possible, such as for sewage treatment plants, master plan elements can be standardized.

The next step in design-to-value is the "de-specification" of structural designs to remove unnecessary costs and to standardize where possible. This can include both measures to take out costs by developers (while maintaining safety) as well as initiatives by local authorities to encourage standardization in the building code. In either case, this means defining clear rules regarding space usage, superstructure systems, facade dimensions, and connectivity to site infrastructure. Exhibit 41 shows examples of the type of rules that a builder might use across a construction portfolio, such as standardized lengths of load-bearing elements or specifications for internal fixtures. One firm imposed a rule requiring modular design measurements so that every element—a wall or a staircase—was some multiple of a standard unit. The increased efficiency from repetition and reduced complexity led to 15 percent savings on structural elements. In another example, floor-to-floor height ratios were standardized to allow only (with rare exceptions) three pre-determined ratios. VBHC (Value & Budget Housing Corporation), a leading affordable housing developer in India uses modular design of apartments so that a one-bedroom unit can be easily turned into a two- or three-bedroom unit, saving costs by repeating the aluminum formwork. Savings also are achieved by using standardized formwork and pre-cut reinforcements to build walls.

Design-to-value approaches can also yield significant savings when specifying smaller elements such as internal and external doors, lighting, electrical systems, and flooring. One builder saved 15 to 30 percent by standardizing on three wooden floor systems. The company saved on procurement costs, and repetition led to greater productivity among workers who install flooring. Another example of standardization is fixing the distances between the wall and sink, and other bath fixtures to streamline installation on site. Furthermore, developers of affordable housing can realize considerable savings by specifying less costly materials (see Box 5, "Cost savings in building materials").

Exhibit 41

Design-to-value techniques can reduce the cost of superstructure and finishing by about 15 percent or more



1 Based on McKinsey case data.
2 Example from Value & Budget Housing Corporation, India.

SOURCE: Value & Budget Housing Corporation; McKinsey project experience; expert assessment; McKinsey Global Institute analysis

Using standard and reusable product catalogs, modular designs, and construction drawings, savings can be realized across construction processes and building materials. Using pre-cast elements can help force standardization since it relies on having four wall elements of exactly the right dimensions. Additional flexibility can be retained for other standard elements. This is also an area where governments can support affordable housing projects by rationalizing variations in building codes and standards so that they enable standardization and scale.

Standardization need not mean cookie-cutter design. Facade elements such as parapets, balconies, and color schemes can be modified to give each project a distinct character and feel. Further, community areas and open spaces can be designed to enhance the aesthetics, livability, and ambience of affordable housing communities.

Design-to-value requires an integrated effort by architects, suppliers, construction site assembly companies, and realtors to agree on product and process design. Without an integrated perspective across suppliers as well as clients, standardization may not work. Finally, to optimize standardization, builders need information technology to manage the flow, such as building information modeling software that links 3D design drawings to data about scheduling and cost.

Box 5. Cost savings in building materials

Choice of materials can also affect construction costs. In India, for example, builders use bricks made from fly ash, a waste product from coal-fired power plants, to replace cement. UN-Habitat's report on sustainable building materials provides a comprehensive overview of building materials for emerging market contexts. [1] Governments should encourage innovation in sustainable and low-cost building materials and techniques for affordable housing construction. Exhibit 42 shows the range of materials where savings can be achieved.

Exhibit 42
A sample of sustainable building materials for affordable housing

	Material	Description
Walls	Fly-ash bricks	Made from fly-ash/volcanic ash along with sand, lime, and gypsum; used as a brick substitute for walls; created from by-products of power plants and industrial waste; environment friendly and cheaper substitute
	Clay fly-ash burnt bricks	Made from soil, fly-ash, sand, and fuel coal; replacement for conventional bricks; manufactured with less emissions and less fuel consumption
	Compressed earth blocks	Soil with minimum levels of clay compressed along with a small proportion of cement. In walls, interlocking blocks minimize mortar and plaster; low energy consumption during production; manufacturing machines can be made mobile
	Hollow concrete blocks	Cement, sand, and aggregates along with industrial waste such as fly-ash, blast furnace slag used to produce blocks that can substitute for bricks; energy and cost efficient, allows faster masonry completion
	Cellular lightweight concrete	Cement, fly-ash, sand, and foaming agent; substitute for conventional bricks/ blocks in multi-story buildings; reduction in deadweight can reduce costs in structure and foundation; high thermal insulation
	Ferrocement wall panels	Cement, sand, aggregates, fiber, and welded mesh combined to create panels of required shapes and sizes; allows for speedy construction
Roofing	Micro-concrete roofing tiles	Tiles made from cement, aggregates, and sand used in place of traditional tile, asbestos, and corrugated sheets; highly cost effective
	Ferrocement roofing channels	Cement, steel, and welded mesh suitable for large spans; speedy installation and 30% cost saving over traditional reinforced concrete roofing, 60-75% lower deadweight
	Reinforced concrete planks, and joists	Cement and sand mixed with steel and binding wire; used for structural roofing, load bearing, and framed structures
Finishing	Bamboo mat boards	Bamboo and polymer boards are an alternative to plywood for use in partitions, door/window shutters, infill paneling, cladding, etc.
	Glass Reinforced Polymer (GRP) doors, shutters and frames	Glass fiber, natural fibers, polyurethane foam, resins, and curing agents used as a substitute to wooden doors and shutters
	Mosaic and check-ered flooring tiles	Cement, sand, aggregates, pigments, marble chips, and powder mixed to create mosaic tiles; used as cost effective flooring alternatives inside homes

SOURCE: Society for Excellence in Habitat Development—Environment Protection & Employment Generation (SHEE); UN-Habitat, *Going green: A handbook of sustainable housing practices in developing countries*; McKinsey Global Institute analysis

1 For a more comprehensive overview of sustainable building materials, see *Going green: A Handbook of sustainable housing practices*, UN-Habitat, 2012.

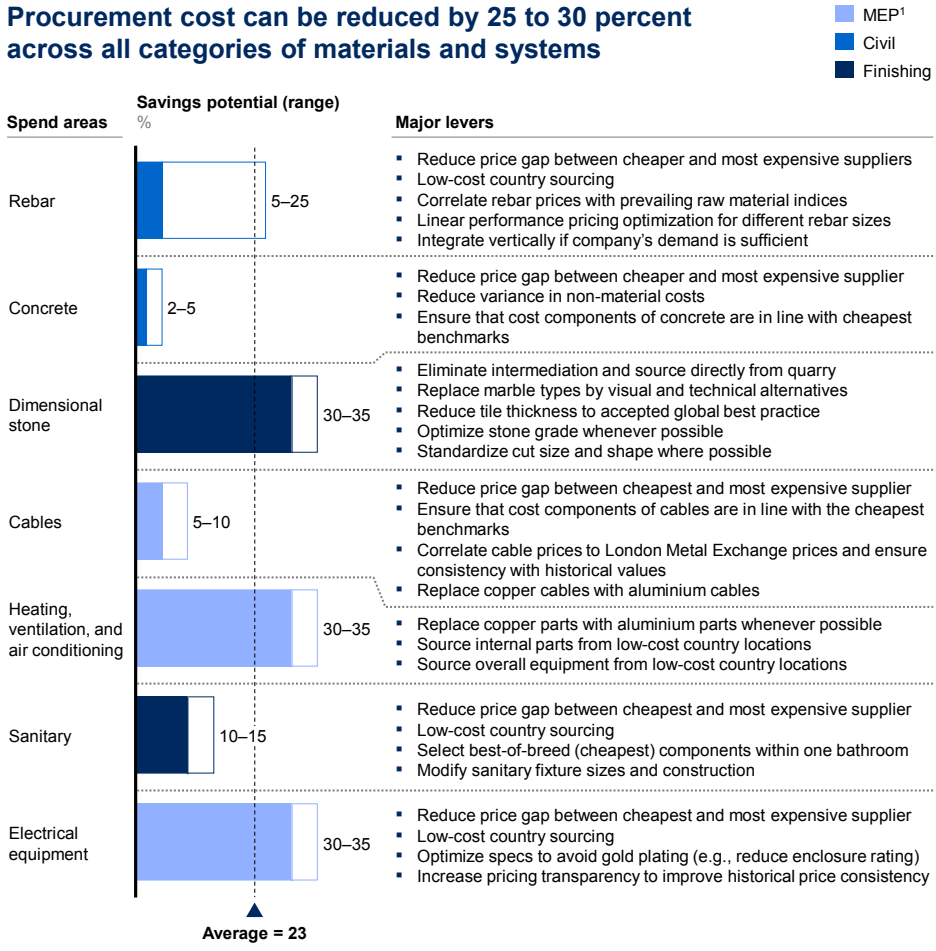
Efficient procurement to save costs on building materials

Purchasing of material, equipment, and services for construction can be highly inefficient. There are many purchasers—developers, contractors, and subcontractors—and orders are typically placed on a project-by-project basis, rather than being bundled. There is little transparency across bids, preventing effective benchmarking, and because so many items are customized it is difficult to price them accurately. Lack of standardization also reduces opportunities for bulk purchases and volume discounts. And, because many builders do not use advanced IT systems for planning, materials are specified at a late stage, forcing purchasing decisions based on delivery time, rather than price.

Best practices in procurement involve selection of an appropriate purchasing strategy, commercial optimization, and technical optimization. Depending on the type of building material, these procurement excellence practices can cut costs by as much as 25 to 30 percent across key spending categories (Exhibit 43).

Exhibit 43

Procurement cost can be reduced by 25 to 30 percent across all categories of materials and systems


MEP[1]
Civil
Finishing
Spend areas
Savings potential (range)
%
Major levers
Rebar
5–25
Reduce price gap between cheaper and most expensive suppliers
Low-cost country sourcing
Correlate rebar prices with prevailing raw material indices
Linear performance pricing optimization for different rebar sizes
Integrate vertically if company's demand is sufficient
Concrete
2–5
Reduce price gap between cheaper and most expensive supplier
Reduce variance in non-material costs
Ensure that cost components of concrete are in line with cheapest benchmarks
Dimensional stone
30–35
Eliminate intermediation and source directly from quarry
Replace marble types by visual and technical alternatives
Reduce tile thickness to accepted global best practice
Optimize stone grade whenever possible
Standardize cut size and shape where possible
Cables
5–10
Reduce price gap between cheapest and most expensive supplier
Ensure that cost components of cables are in line with the cheapest benchmarks
Correlate cable prices to London Metal Exchange prices and ensure consistency with historical values
Replace copper cables with aluminium cables
Heating, ventilation, and air conditioning
30–35
Replace copper parts with aluminium parts whenever possible
Source internal parts from low-cost country locations
Source overall equipment from low-cost country locations
Sanitary
10–15
Reduce price gap between cheapest and most expensive supplier
Low-cost country sourcing
Select best-of-breed (cheapest) components within one bathroom
Modify sanitary fixture sizes and construction
Electrical equipment
30–35
Reduce price gap between cheapest and most expensive supplier
Low-cost country sourcing
Optimize specs to avoid gold plating (e.g., reduce enclosure rating)
Increase pricing transparency to improve historical price consistency
Average = 23

1 Mechanical, electrical, plumbing.
SOURCE: McKinsey Global Institute analysis

Purchasing strategies should be determined by the level of complexity and nature of materials involved. For example, for engineering-intensive purchases such as electrical and ventilation systems, a central purchasing approach could be preferred, with big-ticket items purchased separately from wholesalers or manufacturers. Repetitive labor-intensive services, meanwhile, such as flooring

or painting, could be sourced under long-term contracts with carefully selected vendors that can handle multiple projects or cover one region.

Commercial optimization is about getting the best possible prices. It involves supplier and volume consolidation, improving pricing through an enhanced bidding process (demanding separation of material and labor costs, for example), and bundling when contracts have similar scope and timing. The UK Procurement Efficiency Initiative for social housing has achieved 15 to 30 percent savings on material costs by establishing purchasing consortia, which has allowed owners to bundle orders and qualify for volume discounts. Another opportunity, low-cost country sourcing, can lead to savings of 40 percent or more for specific categories. For example, one firm looked into the price of oak for parquet flooring around the world and found prices ranged from $20 to $27 per square meter, a potential saving of 35 percent. Creating highly detailed bid requests has allowed construction companies to isolate and understand different cost components, request alternative specifications, and set values on long-term vendor agreements.

Technical optimization involves standardization of sourcing categories and identification of substitutes through advanced costing tools. Standardizing materials used across various construction steps can lead to volume discounts. Advanced costing tools can perform bottom-up "clean sheet" cost analyses that allow the purchaser to estimate the actual cost to the supplier, independent of the market price. Quoting clean sheet costs can be a powerful tool in negotiations; it demonstrates understanding of price dynamics, puts the burden on suppliers to justify their prices, and creates a basis for jointly exploring possible cost improvements.

Lean execution can eliminate waste in construction

Execution—how a construction project is carried out—is an area where many construction firms have not made progress and is an important factor in stagnant productivity. As one leading industry participant noted, activities on most construction sites continue to be carried out as a series of successive events without regard for potential time savings that could be realized by carrying out tasks in parallel. Typically, overly generous buffer times are scheduled between activities, leading to increased waiting times. In addition, there is little understanding of how long activities need to take or the extent of waste across construction steps.

Execution of construction tasks can be addressed through a series of lean operational measures. The first is critical-path management to optimize the execution of all activities along the "critical chain"—the sequence of activities that must be completed on time for a project to finish by a certain date. This can be achieved by examining the sequence of activities along the critical path and then minimizing waste, cutting non-essential activities, combining related activities, and reallocating resources to where they will have the greatest impact. In some cases, critical-path improvements have been achieved through use of "micro-plans." Each activity was tracked and combined with visual layouts of critical-path tasks. This enabled teams of workers to monitor performance against the plan. Additional measures to improve execution along the critical path include adapting incentive systems linked to cycle time performance, introducing training programs, and adopting management tools such as performance dashboards and instituting daily performance dialogues.

A second measure is construction flow balancing, which involves creating an optimized activity flow that reflects ideal allocation of resources and activity duration. For example, in one company, the activities of carpenters were optimized after their work flow was analyzed. Before optimization, carpenters produced flat wood elements on a workbench, and production was frequently interrupted by operators looking for tools or materials and parts. After a construction flow balancing exercise, carpenters created a material depot and toolbar next to the workbench, which greatly reduced production time.

A third measure is process step productivity enhancement, which focuses on improving activities on the critical path. Many construction activities can be shortened by 20 to 30 percent when incidental activities such as assembling tools and materials, collecting waste, or speaking with supervisors are reduced, shifted to other workers, or eliminated. The new standard operating procedures should then be documented, listing every step so workers and supervisors know what needs to be done. These documented steps can then be integrated into worker training programs. Careful analysis of critical-path activities and sequencing is especially important when implementing industrial approaches, such as extensive use of prefabricated parts. To achieve the greatest benefits, non-critical activities must be shifted from the building site to a factory and sequencing construction steps as if on a production line.

An industrial approach can convert housing construction into housing production, saving both cost and time

Unproductive construction methods are still used around the world and contribute to high costs. They are particularly common in developing economies that have the greatest need for affordable housing. Industrial approaches are intended to make construction more like manufacturing, by using more standard elements and mechanization, and relying less on labor-intensive processes.

The goal for industrial construction methods is to save cost and time by converting housing construction into housing production. This is conceptually simple, but it can be complex to implement on a large scale. Assembling prefab or pre-cast components requires large capital investments that can be justified only by high utilization, which means that there must be sufficient demand. This is one reason that, even though much of the technology for making construction more like manufacturing has existed for decades, the industrial approach is still not in wide use. The missing link is to match the technology with programs that can enable scale relative to the capital investments.

The industrial approach saves money and time by moving critical construction processes off-site or by using advanced on-site (*in situ*) techniques to fabricate key elements more efficiently (see Box 6, “A growing choice of industrial approaches”). One of the most effective applications of the industrial approach has been to manufacture structural elements that can be assembled on-site, such as concrete slabs and walls. Much of the focus of industrial approaches is on superstructures since substructures tend to require customization for variations in site and soil conditions.

Box 6. A growing choice of industrial construction approaches

We identify a range of industrial construction methods (Exhibit 44). Several depend on prefabricated parts, from reinforced-concrete framing elements to factory-built homes. The most commonly used off-site components are pre-cast and prefabricated systems (steel and concrete frames, pre-cast panels, and structurally insulated panels, for example). The most commonly used *in situ* systems include tunnel formworks and lightweight metal formworks, a system that enables the casting of horizontal and vertical elements simultaneously so walls and slabs can be cast in one operation in a daily cycle. This approach combines the speed, quality, and accuracy of off-site production with the flexibility of on-site construction.

Exhibit 44
Choices of industrial approaches

Approach	Type	Description
Superstructure technologies	Prefabrication	Light gauge steel frames	Galvanized steel sheets, roll formed into profiles used for framing
		Pre-cast concrete frames	Reinforced concrete framing elements, including columns and beams pre-cast in factory (not commonly used in housing)
		Pre-cast concrete panels	Large concrete walls and slab panels prefabricated in factory
		Structurally insulated panels	Insulating foam core sandwiched between two structural facings, typically metal sheet or cement
		Glass fiber-reinforced panels	High-strength fiberglass is embedded into gypsum, lightweight concrete, and plastic to form panels, improve structural properties
		Volumetric pre-cast construction	Extension of pre-cast concrete panels systems
		Modular homes	Sectional prefabricated buildings that consist of multiple modules constructed indoors on assembly lines
		Complete factory-built homes	Completely constructed and assembled off-site in a factory
	In situ	Mortarless block construction	Concrete masonry units laid dry and subsequently grouted, partially grouted, or surface bonded
		Lightweight/foam concrete blocks	Made from cast concrete, i.e., Portland cement and aggregate, usually sand and fine gravel for high-density blocks
		Tunnel formwork	Steel formwork system that allows casting of walls and slabs in one operation
		Lightweight/reusable formwork	Lightweight reusable panel forms made from aluminum or plastic
		Insulated concrete forms	Made from polystyrene foam or beads, used as stay-in-place forms that are dry stacked and filled with concrete

SOURCE: McKinsey Global Institute analysis

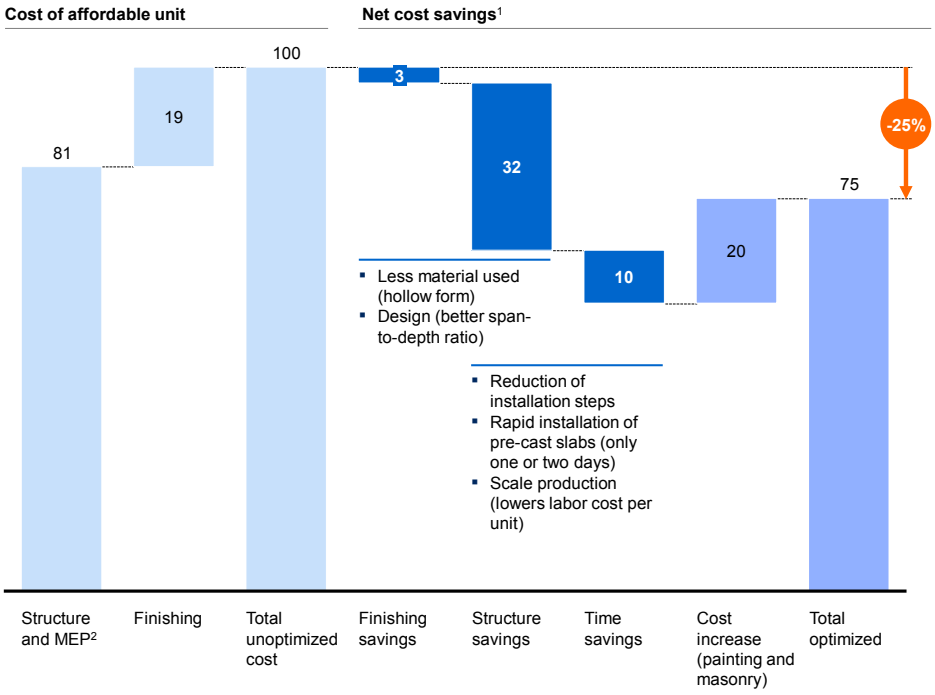
Affordable housing programs in Mexico, South Africa, and Turkey have used such approaches. In South Africa, for instance, the costs of medium-density affordable housing projects were cut by 25 to 30 percent using industrial processes (Exhibit 45). The buildings used pre-cast slabs, which took one or two days to assemble. Using value engineering, the agency specified a hollow-form design that saved material and improved the span-to-depth ratio of slabs. In Japan and Thailand, prefabricated and pre-cast housing have been completed in 24 to 35 days.

Exhibit 45

Industrial construction and value engineering helped save 25 percent in a South African affordable housing project

Construction cost of hollow-core pre-cast with *in situ* construction on two medium-density buildings

Indexed averages



1 Methodology: comparison of costs of two medium density residential developments, *in situ* costs based on contractor quotes gathered before construction, pre-cast costs based on actual construction cost and time; cost comparison, as well as design specification and quality control conducted by independent auditors.

2 Mechanical, engineering, plumbing.

SOURCE: Concrete Manufacturers Association of South Africa; McKinsey Global Institute analysis

Some developers believe that time savings, rather than cost savings, are the most significant benefits of industrial approaches. This is particularly true in developing economies with low labor costs—if the potential time savings are not wiped out by slow permitting and approvals. The experience of developers in India indicates that use of pre-cast components can shave ten months off a 34-month schedule. There are examples from India, Mexico, and South Africa where the use of prefab components has cut construction time by 40 to 50 percent. In Japan and Thailand, prefabricated and pre-cast housing is being completed in 24 to 35 days. This is largely because structural components can be cast while construction of the foundation is under way.

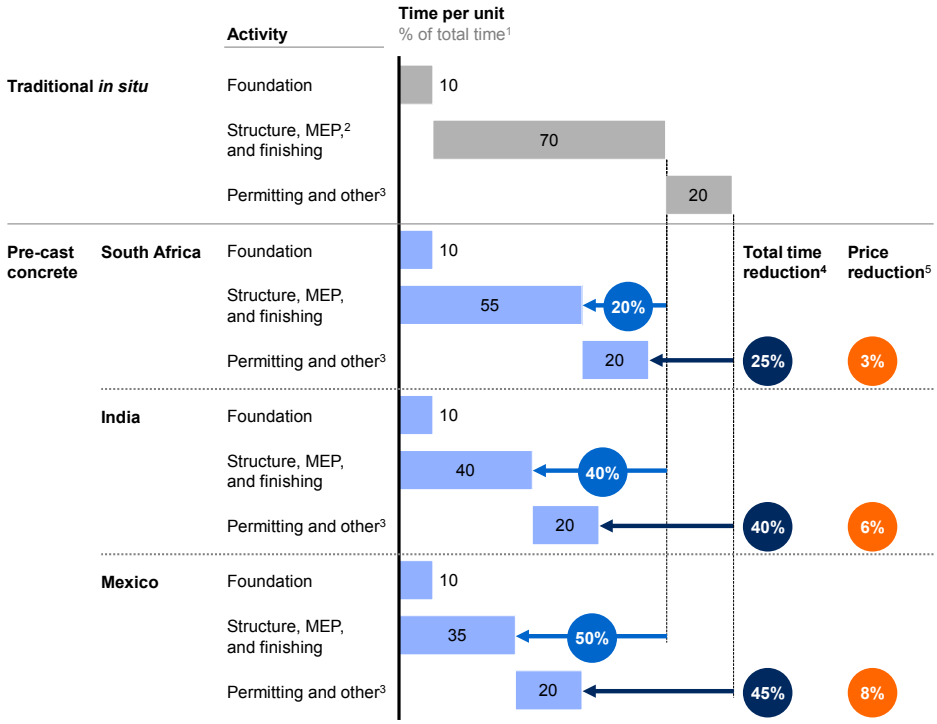
Compressing the construction timeline can raise the rate of return on a development or allow the developer to sell at a lower price point. Examples from select markets indicate price points can be reduced by as much as 8 percent through savings generated by a 40 to 50 percent shorter construction period (Exhibit 46). Alternately, developers can maintain the same price points they targeted before the savings and enjoy a higher return.

Exhibit 46

Using pre-cast components can cut schedules by about 45 percent, which translates into savings of about 8 percent

Timelines of traditional construction vs. pre-cast examples

Single unit



1 Expressed in percent of total time due to varying absolute time schedules because of, for example, building type, construction process, country and local factors, or location of site.
2 Mechanical, engineering, plumbing.
3 Assuming constant at 10%; actual value varies by country/locality.
4 Assuming baseline construction schedule of 36 months.
5 Assuming constant internal rate of return of 20–22%, baseline project schedule of 36 months.

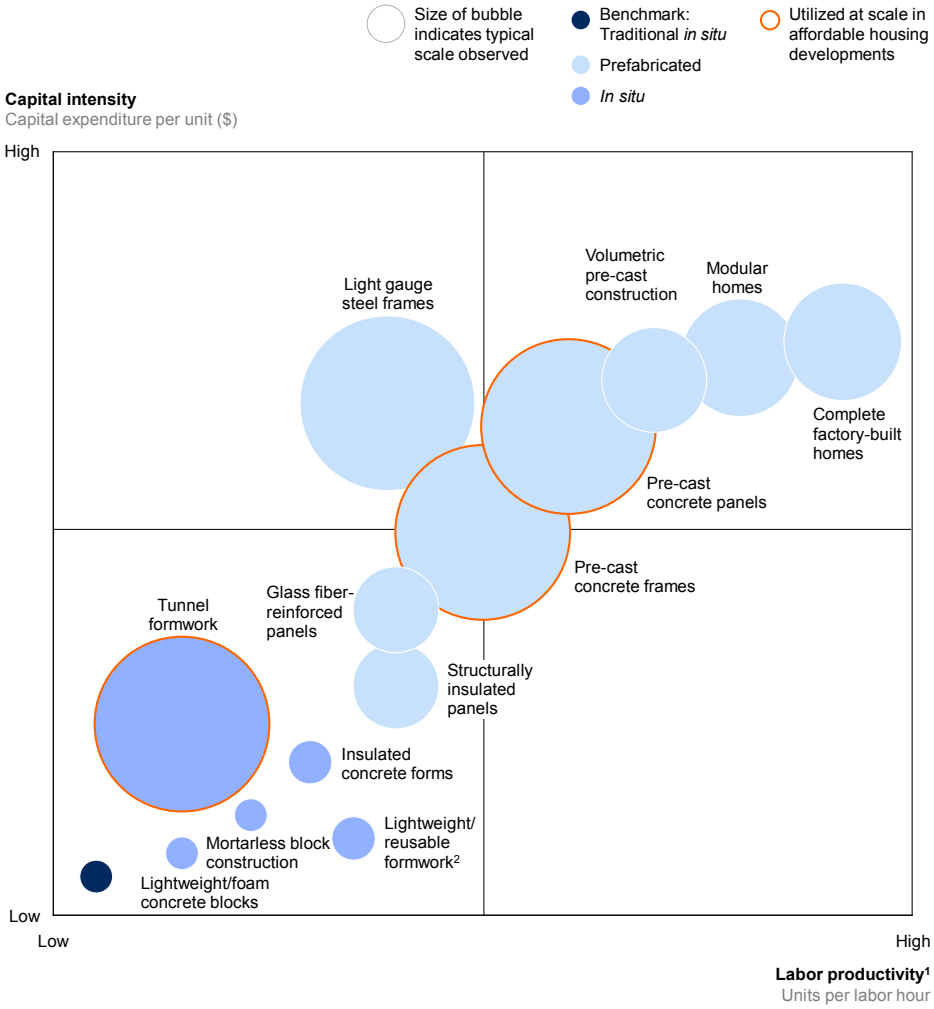
SOURCE: Construction company details; McKinsey Global Institute analysis

Assuming the building materials used remain the same, the choice of technology is a function of trade-offs between capital investment the technology requires and the labor productivity that it enables (Exhibit 47). *In situ* approaches tend to be less capital-intensive but require more labor and construction steps. Prefabricated systems tend to be more capital-intensive. They also reduce the reliance on on-site labor to specific steps involving assembly and installation of the prefabricated components. However, prefabricated systems in general require certainty of scale to justify the capital investments.

Exhibit 47

There is a trade-off between capital expense and improved labor productivity in industrial construction methods

ILLUSTRATIVE



1 High labor productivity implies lower labor input needed for equal output; proxy for labor availability.
2 For example, aluminum and plastic forms.
SOURCE: Expert interviews; McKinsey Global Institute analysis

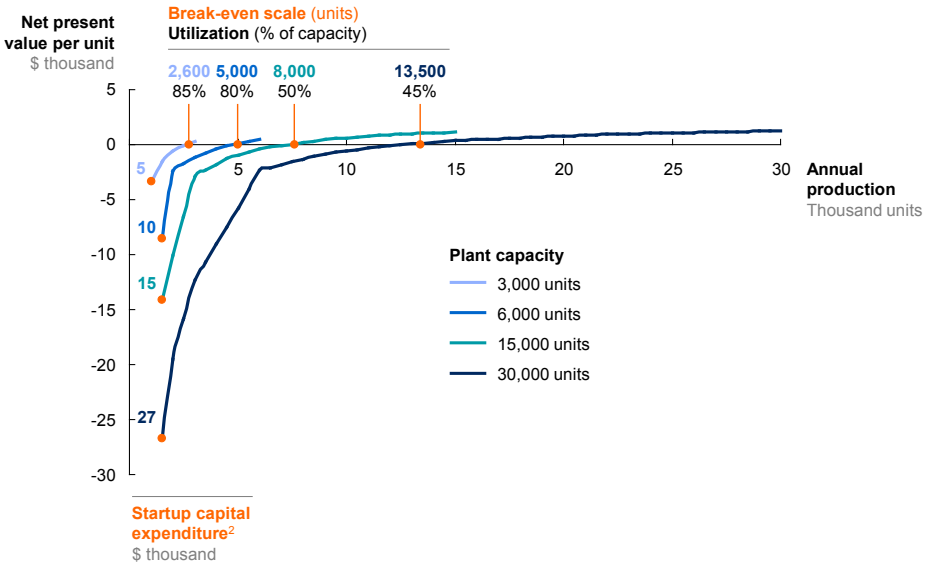
An analysis of an automated pre-cast factory producing slabs and panels in standard sizes for housing projects indicates that the required capital investment would be at least $30 million. This is for capacity to produce the equivalent of 220 square meters of solid walls per hour or 180 square meters of floor slabs. Assuming two eight-hour shifts and an average housing unit size of 40 square meters, such a plant could build components for 12,500 homes a year.

The required demand to achieve profitability varies by the amount of capital invested. Building plants with low unit capacity requires higher utilization rates but relatively lower overall demand. A semi-automated pre-cast plant with the capacity to build the equivalent 3,000 units of 50 square meters units per year needs to sell only 2,600 units, or roughly 85 percent utilization, to have a positive net present value (Exhibit 48). Larger plants need to sell more absolute units (up to 13,500 per year in our example), but they achieve profitable returns at lower utilization rates by taking advantage of scale effects. These calculations depend heavily on the degree of automation and regional labor costs.

Exhibit 48

A plant to produce pre-cast building components can break even at 5,000 to 8,000 housing units annually

Break-even scale for 3,000–30,000 unit pre-cast plants[1]



1 Assumptions: Average cost of capital, 10%; unit price, $19,500; EBITDA margin, 10%; structure share of revenue, ~30%; depreciation/lifetime of plant, 10 years; maintenance, 0.5% of revenue; corporate tax rate, 25%; debt share of capital expense, 70%; interest rate, 5%; standard unit size, 50 square meters.
2 Based on manufacturer business plans. Capital expenditure figures based on assumption of low labor cost.

SOURCE: *Scaling-up affordable housing supply in Brazil: The My House My Life programme*, UN-Habitat, 2013; KPMG; Turner and Townsend; expert interviews; publicly available information of manufacturers; McKinsey Global Institute analysis

Capital costs are far lower for advanced *in situ* processes, such as tunnel forms. A tunnel-form set can be engineered for about $150,000 and can be used approximately 200 times. Assuming five sets are used on a construction site, this system can produce 12,500 units per year at one-third the capital cost (about $10 million) but with higher labor involvement. Typically, the man-hours on a building site are three times those needed in off-site production. And there are additional considerations: on-site waste is typically 10 percent while it is only 1 percent in a factory. And more material may be used on-site. Cement consumption in reference projects is approximately 100 kilograms more per cubic meter of concrete on-site.

The manufacturing principles underlying industrial construction approaches can also be extended to routine on-site activities to make them more efficient. Many tasks can be broken down into a series of standard steps; once the steps are defined, a careful analysis can determine which ones can be done in parallel to save time or carried out more effectively off-site. For steps that need to be done on-site, a “lean execution” analysis can help optimize cycle times and labor requirements. Such analysis brings an industrial mindset to on-site construction and can even apply to finishing, a labor-intensive step that can account for 30 to 40 percent of construction costs. Finishing (painting, plastering, and glazing, for example) typically involves many subscale suppliers and contractors. To get industrial-style efficiency in finishing, builders need to standardize specifications in finishing elements and establish a standard set of vendors. Finishing activities can then be carefully sequenced to complete projects in the shortest possible time.

Steps toward adoption of industrial construction methods

For all the clear advantages that industrial approaches to construction have demonstrated, adoption remains challenging for several reasons. These range from the need to upgrade labor skills to supply-chain issues. Most importantly, the industry needs to perfect use of industrial methods on a large scale to realize all the potential benefits.

- **Training the labor force.** Since repetitive sequencing of construction steps is at the heart of the industrial approach, it is critical to train workers to be highly productive at repeatable tasks. This also reduces the dependence on subcontractors, which typically rely on a floating labor pool that would have a long learning curve on every job. Therefore, the industrial approach requires an integrated training and skill development program and operating manuals that describe a standard, structured way of executing each construction step.

- **Creating the proper logistics infrastructure.** Cost-effective off-site production depends on a logistics infrastructure and road networks that can get prefabricated parts to job sites in a just-in-time way. For example, in Saudi Arabia, we estimate that a prefabrication plant that is within 200 kilometers (a two- to three-hour drive) can work, enabling two supply runs per day. However, in markets where the average speed of the road network is slow, such as Mumbai, a prefab plant would need to be no more than 10 to 30 kilometers away from construction sites. There would also have to be sufficient construction demand within the serviceable area to justify the investment. In Bangkok, for instance, one pre-cast factory is producing 700 housing units per month in one location with a delivery radius of less than 50 kilometers.

- **Perfecting industrial processes on a large scale.** Completely prefabricated systems work now, but they need to be scaled up to be more efficient. The Broad Group, a Chinese industrial and construction company, has demonstrated just how quickly a building can be completed using prefabricated components. Starting with a completed foundation (which took six months to build), Broad erected a 30-floor tower in 15 days. It used a steel structure (with some concrete lining to meet the building code); 93 percent of the work was done in the factory and 7 percent on the site. Most prefab projects do 40 to 50 percent of the work off-site. The most important component used in this approach was a 3.9-by-15.6–meter main board with flooring, ceiling, and embedded shafts for ventilation, plumbing, electricity, and lighting. On-site, workers need to merely attach these elements with bolts and perform final touch-up and finishing. Construction costs in this case are estimated at $1,000 to $1,200 per square meter (Exhibit 49).

- **Achieving certainty of scale.** While industrialized approaches have been proven to save time and money, for them to work in affordable housing, they will need to be perfected on a larger scale over the coming decade. Mirroring the manufacturing industry on which it is modeled, the industrial construction approach requires an integrated value chain, starting with design standardization and procurement excellence and lean execution, and extending through to the customer. A fully prefabricated approach also

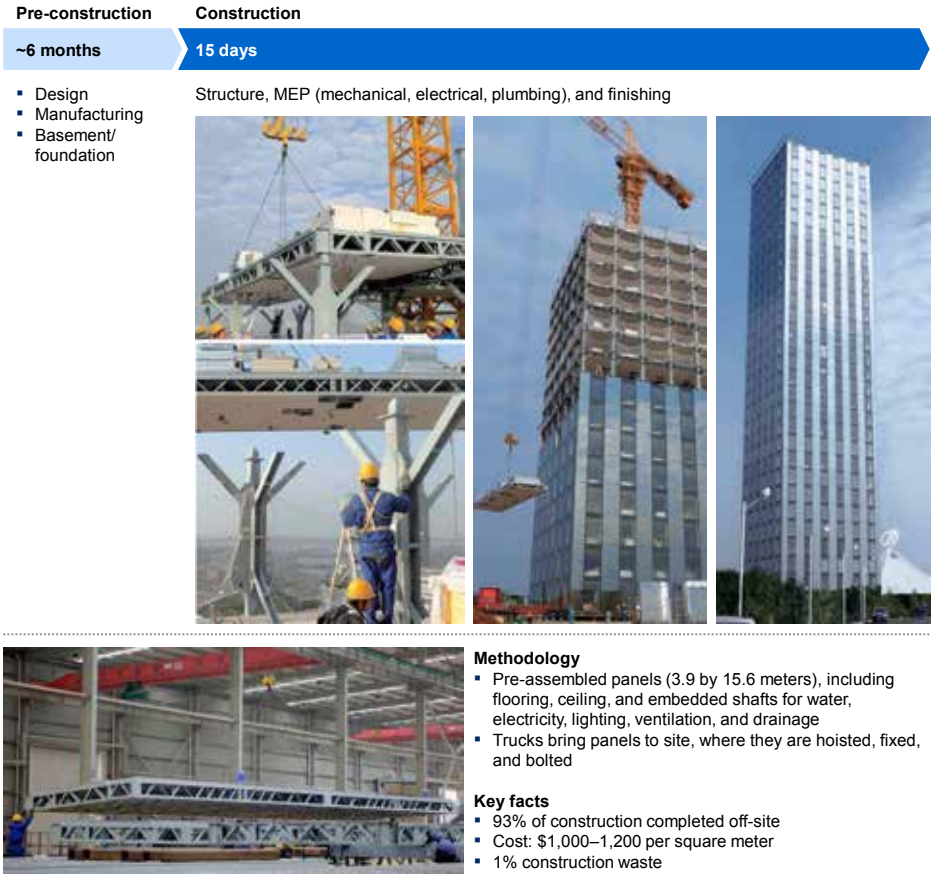
requires a higher level of investment in design, production equipment, and technology. This can work only if there is large-scale production to justify all these investments. However, in many markets, certainty of scale is still a challenge. Even if the underlying demand exists within a reasonable radius, uncertainties about access to land and finance, as well as regulatory hurdles have persuaded developers to stick with on-site approaches.

- **Addressing design shortcomings.** Lastly, there are barriers to acceptance of prefabricated buildings, which earned a bad reputation for drab, uniform design and poor quality when they were used in large-scale housing complexes in the former Soviet Union and East Germany. Many of these buildings were eventually demolished, and industrialized housing construction remains associated with failed developments, even though developers have found ways to address design shortcomings by varying elements such as facades in order to build communities with distinct identities.

Exhibit 49

A glimpse of things to come: Assembling a high-rise in 15 days (from prefabricated components that took six months to manufacture)

Broad Group demonstration project in Hunan Province—T30A Tower Hotel



Methodology
- Pre-assembled panels (3.9 by 15.6 meters), including flooring, ceiling, and embedded shafts for water, electricity, lighting, ventilation, and drainage
- Trucks bring panels to site, where they are hoisted, fixed, and bolted

Key facts
- 93% of construction completed off-site
- Cost: $1,000–1,200 per square meter
- 1% construction waste

SOURCE: Broad Group; expert interviews; McKinsey Global Institute analysis

Government can play a critical role in adoption of industrial methods

Governments can help accelerate the use of industrial approaches to construction and make them practical and available for affordable housing. It can help in the following ways:

- **Enabling scale.** To help provide the scale that industrial techniques require, government can work with the private sector to generate construction volumes—through public-private developments, incentives for private development on large land parcels, and other initiatives. It can also help create demand within specific areas to achieve the minimum scale required for capital investments in fabricating plants. Lastly, government schemes that reduce end-user financing costs, enhance the creditworthiness of targeted population segments, or reduce search costs also act as demand enablers.

- **Pooling volume.** For specific building materials that can be standardized across vendors, government can play a role in pooling volume and allowing multiple developers and contractors to benefit from frame contracts for purchasing specific building materials. Such volume contracts can provide an option for procurement of building materials at cheaper costs. The procurement efficiency initiative for affordable housing in the United Kingdom is an example of such an initiative.

- **Shaping consumer acceptance.** Factory-produced houses still carry a stigma in many markets. This negative perception is driven by lack of knowledge about the quality of these homes. The government can play a role in supporting the housing industry in educating consumers and encouraging acceptance. This can be done through mechanisms such as government-enabled certifications, quality assurance programs, consumer incentives, and technical assistance programs for builders.

- **Reducing financing risk.** Governments play a large role in the financing ability of construction companies. Lower financing costs or increased access to financing pools can play a large role in determining the risk appetite of construction companies to invest in industrial scale construction methods.

- **Standardizing building codes.** There are many examples around the world where building codes vary considerably across the country and provinces—and sometimes even within cities. If government would make the effort to promulgate uniform building codes across cities, provinces, or even across the entire country, the standardization would help enable the growth of industrial construction approaches.

- **Supporting innovation.** Given the limited innovation and knowledge sharing within the construction industry, government can play a key role in encouraging and incubating innovation. This could be through support in terms of innovation for lower-cost building materials for the sector (such as those supported by the Brazilian government as part of the *Minha Casa Minha Vida* program[63]), housing technology incubators, and innovation centers set up through government support.

63 *Scaling-up affordable housing supply in Brazil: The My House My Life program*, UN-Habitat, 2013.

- **Improving competition and industry structure.** In many countries, government may need to improve the structure of fragmented construction and real estate industries so they can take on affordable housing development. It can do so in a variety of ways. For example, government can encourage participation of smaller players in tenders for public projects so these firms can build capacity over time and help open competition to more players. It can also support participation by international developers in public procurement programs and ease the rules for foreign players to enter the market and tie up with local developers. This will enable both capacity and capability building in the market and accelerate the introduction of new technologies and approaches. Governments can also improve access to finance for leasing companies and support the development of specialized leasing companies to provide machinery and equipment to affordable housing developers.

Expert insight

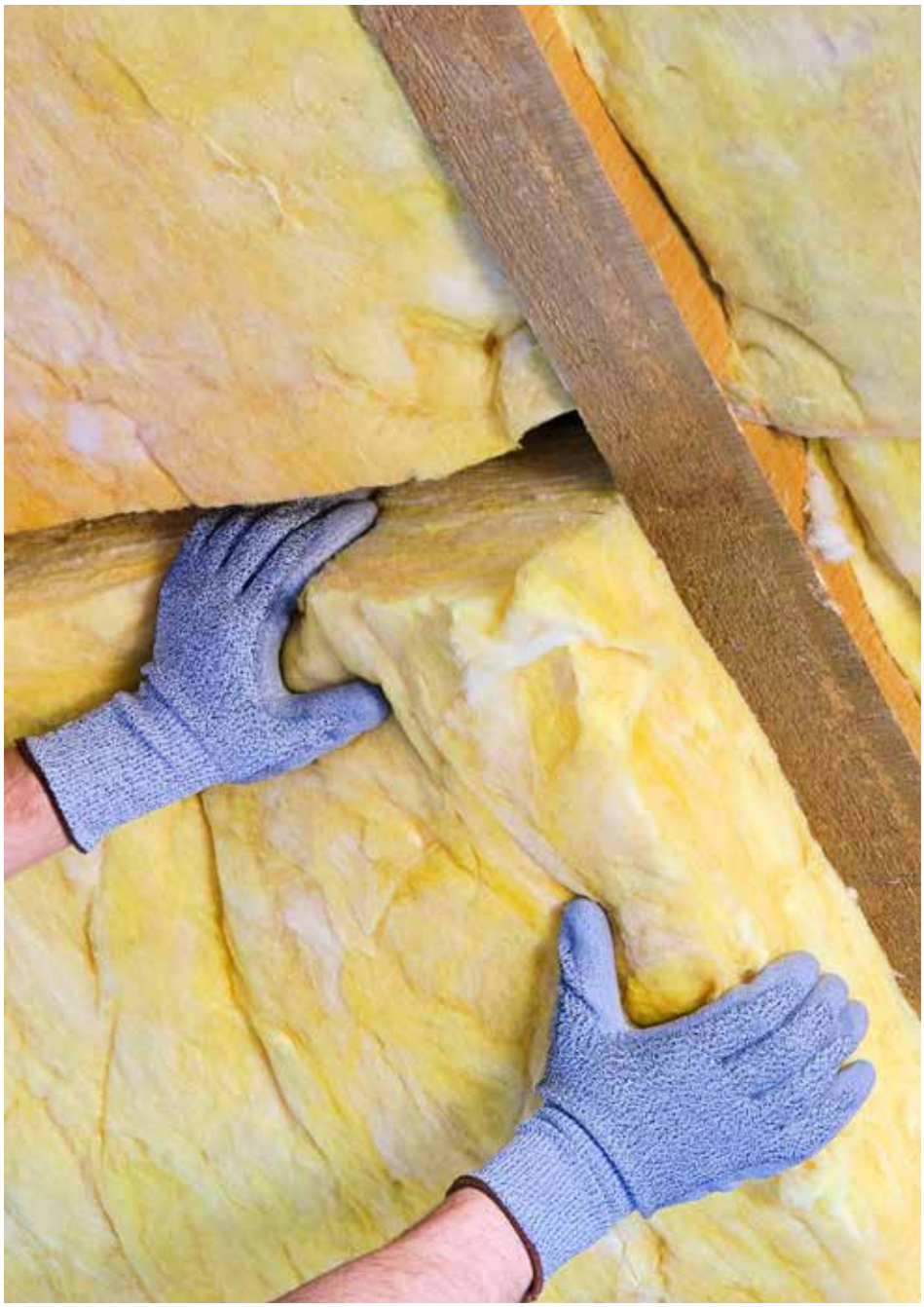
Christian Prilhofer, president of Prilhofer Consulting, expert on industrial construction methods

Q: Why haven't industrial approaches to construction been more widely adopted?

A: From our experience around the world, we have learned the following: due to lack of political will and capability in long-term urban planning, in most countries the construction industry is unable to plan and invest in industrial methods. To get companies to invest in industrial methods, governments must develop planning strategies away from election periods. Governments must recognize that affordable housing needs the same long-term planning as building highways or dams. It is sad to see that in countries where governments are not so dependent on the voters' will, this process is simpler.

Also, in many countries, contracting companies have only a short-term mindset and plan from project to project. And middle management often opposes industrial methods because of the changes and the transparency required. Further, contracting companies tend to see industrial approaches such as pre-cast only as another form of building material, not as a new system. Today contracting companies are just service companies that are building products that are designed by others and approved by the owner. To be successful in the use of industrial methods, contractors must be part of the design process. Building companies should view buildings as their product, the way a successful manufacturer would, taking full responsibility for design of critical parts as well as assembly, and constantly pushing for quality improvements and cost reductions.

Efficiencies in operations and maintenance can reduce costs and preserve sound housing stock



There are great savings opportunities in improving how buildings are operated and maintained, which can make a significant contribution to expanding access to affordable housing. Buildings can be designed (or retrofitted) to run more efficiently—requiring less energy, for example—and maintenance can be delivered at far lower costs by bringing scale benefits and clarity to what has been a highly fragmented and opaque market. Making repair and maintenance more affordable can also help avoid loss of housing stock to dilapidation and reduce the number of people living in substandard units. Even in the EU-27 countries, 15 percent of housing units have defects such as leaking roofs, dampness (in walls, floors, or foundations), or rot (in window frames or floors), according to Eurostat.

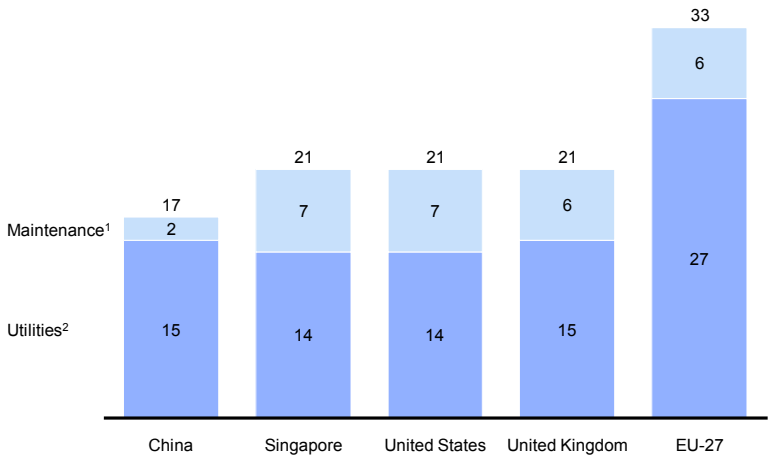
Operations and maintenance (O&M) account for up to 20 to 30 percent of housing costs depending on the country (Exhibit 50). In the EU-27 nations, O&M averages 33 percent of housing costs, reflecting relatively high electricity and gas prices. O&M is 21 percent of housing costs in Singapore and 17 percent in China. Globally, operations typically account for more than two-thirds of O&M costs, which include electricity, gas, fuel oil, other fuels, and water. Maintenance consumes between 10 and 35 percent of O&M costs, driven mostly by spending on repairs. Reducing O&M costs is an obvious target, but the effort is complicated by conflicting and misaligned incentives. For example, if tenants pay for heat and utilities, landlords have little incentive to invest in insulation or thermal windows. Leaseholders may have no reason to make improvements on property they do not own.

Exhibit 50

Operations and maintenance (O&M) accounts for 20 to 30 percent of annual housing costs

O&M cost as share of housing expenditures

%



1 Includes maintenance and repairs.
2 Includes electricity, gas, fuel oil, other fuels, and water.
SOURCE: US Consumer Expenditures Survey (2012); Eurostat (2005); Department of Statistics Singapore (2014); China Statistical Yearbook (2012); McKinsey Global Institute analysis

There are two major strategies to reduce O&M costs—improving energy efficiency and saving money in maintenance operations by creating economies of scale. In addition, establishing strong housing-quality standards can not only force owners to maintain properties, but they also can also reduce dilapidation.

Based on examples from around the world, we estimate that energy costs—the biggest component of operations—can be reduced by 20 to 30 percent. Where owners have consolidated demand, maintenance costs have been cut by as much as 25 percent. This suggests that total cost savings of 10 to 15 percent are possible in operations and maintenance. Accomplishing these results requires specific policy and regulatory actions, such as mandating use of energy-saving building materials and setting housing-quality standards, which helps ensure proper maintenance and reduce the number of units that fall into a dilapidated condition.

IMPROVING ENERGY EFFICIENCY

Energy efficiency in affordable housing is achieved by reducing energy consumption in two ways: retrofitting existing buildings with energy-saving components, such as insulated windows, and mandating energy standards for new construction and home appliances. China, the United Kingdom, and the United States have implemented policies to encourage these measures, using a combination of subsidies.

Back in 1976, following the first oil shock, the United States authorized the Weatherization Assistance Program, which has given grants to help retrofit 180,000 low-income homes per year with energy-saving insulation and other improvements. Homeowners who meet income requirements and landlords of buildings in which two-thirds of the tenants meet income limits are eligible for the grants. The program is administered mostly by local non-profit associations using federal funding channeled through the states. A weatherization crew visits the home, assesses the need for upgrades, and recommends insulation, updates to heating and cooling systems, or other measures to reduce energy consumption. As a result of the program, the annual energy bill for households has fallen by 22 percent, yielding $1.65 in value for each dollar spent on the program.[64]

A similar program in the United Kingdom, the Warm Front Scheme, retrofitted 164,000 homes per year with insulation and more efficient heating systems between 2000 and 2013. In the UK program, needs assessment was outsourced to an independent firm and the installation work was carried out by approved local contractors, which the homeowners selected. The government funded the work with grants to homeowners. Homes in the program had 33 percent lower energy bills, on average, providing about $2 of benefit for every dollar invested.

China's approach, while larger in scale, has had more moderate results. Its program in 15 northern provinces provided residential retrofits to buildings totaling 182 million square meters from 2006 to 2011, installing heat meters and control equipment, efficient building envelopes (walls, windows), and improvements to heating systems. Assessment and installation are handled by private contractors, supervised by local authorities. The central government pays for 15 to 20 percent of costs, with funding channeled through provincial governments. Energy cost savings are estimated at 10 percent.

64 US Department of Energy, Office of Energy Efficiency and Renewable Energy.

In addition to retrofitting existing properties to improve energy efficiency, housing agencies and developers can design with efficiency in mind. Buildings can be oriented on their sites to take advantage of light and prevailing winds and constructed with good insulation of walls and windows. Units can be laid out to catch breezes and with windows to take advantage of cross-ventilation, reducing the need for air-conditioning. Landscaping with trees can avoid urban heat islands.[65]

REDUCING MAINTENANCE COSTS THROUGH MARKET IMPROVEMENTS AND SCALE

In many countries the market for maintenance services is opaque and highly fragmented, on both the consumer and supplier sides. Individual homeowners, managers of multifamily housing, and homeowner associations have little buying clout and often lack the knowledge to negotiate for better service and pricing. On the supplier side, many small players lack scale and, in some cases, the training and resources to maintain and repair housing professionally. There is limited market information on both sides. This market can be improved to the benefit of all parties in two ways: consolidating buyers and arming them with greater knowledge, and consolidating and certifying suppliers.

On the purchasing side, the effectiveness of aggregating demand can be seen in the United Kingdom's Procurement Efficiency Initiative. The program was launched in 2005 to reduce maintenance costs in social housing (low-income housing regulated by the state and usually owned by a local council or non-profit) through group purchasing of maintenance services. From 2008 to 2013, 161 social landlords were grouped into 13 procurement consortia across England, providing a 15-fold increase in scale and purchasing power, on average, for landlords. The program reduced costs of routine repairs, maintenance, and energy-saving retrofits by an estimated 25 percent—saving about $100 million over four years (Exhibit 51).

Bolstering the capabilities of homeowner's associations can also result in more efficient purchasing of maintenance services. Associations can use bylaws to define standards for building maintenance, define clear rules for maintenance funding, and assign roles to members.

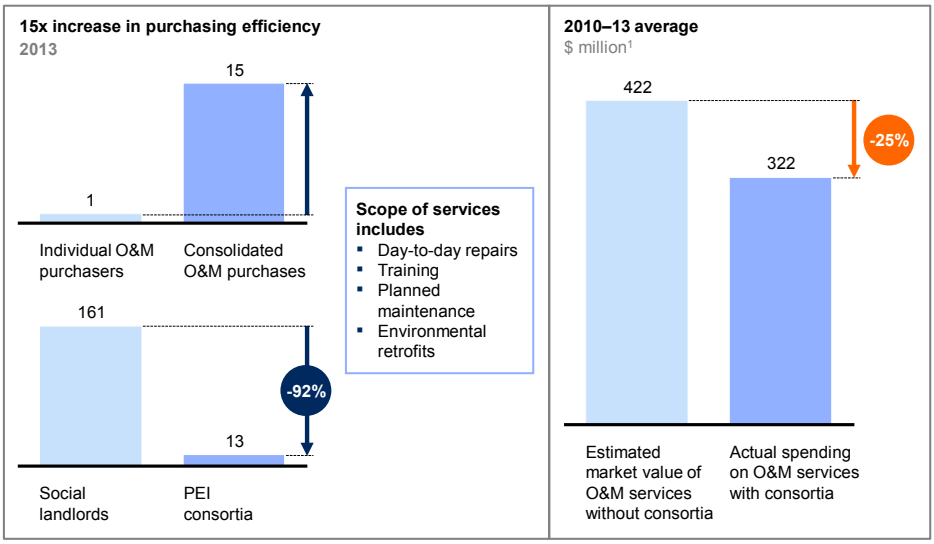
In Slovakia, where homeowner associations have taken over responsibility for running former state-owned housing, laws regulating such groups have been updated in the past two decades to give associations more power. The rules make clear that the mission of homeowner associations includes improving the efficiency of their properties and preserving housing assets, and the law sets standards for operations and maintenance. The law confers legal status on homeowner associations (as non-profits), which gives them the ability to handle funds and for associations from different housing developments to work together to aggregate demand. Associations can create a maintenance fund from monthly member fees and can use properties as collateral to raise funds. Over time, associations can become an educational resource, to provide information and expertise on topics such as energy efficiency.

65 For more, see Richard Barkham and Claudia Murray, *Sustainable social housing: Analysis of award-winning cases*, Grosvenor Group, 2012.

Exhibit 51

Increasing scale in operations and maintenance can reduce maintenance costs by about 25 percent

Scale improvements through formation of UK landlord consortia



1 Exchange rate 1 GBP = $1.60.
SOURCE: Procurement Efficiency Initiative, 2012/2013 annual report, website; McKinsey Global Institute analysis

On the supply side, efficiencies can be realized by consolidating a fragmented maintenance and repair industry. This creates opportunities for providers to grow into better-capitalized and more capable players and develop long-term relationships with subcontractors and material suppliers and to take advantage of economies of scale. Furthermore, fewer suppliers make it easier for regulators to monitor quality and adherence to standards.

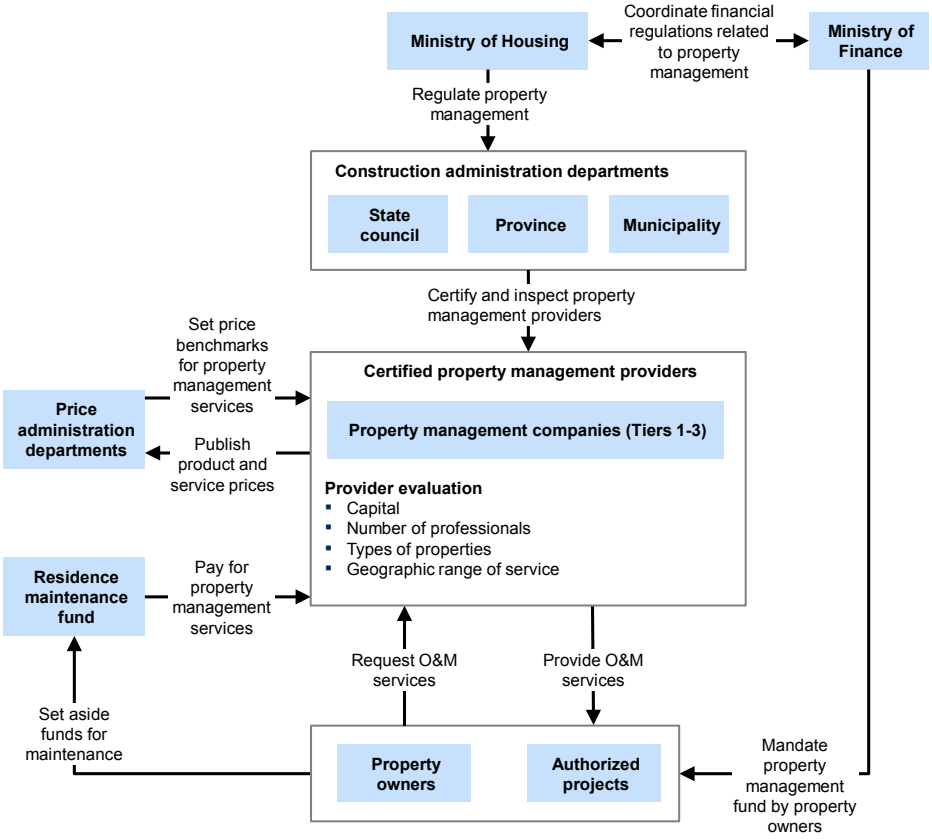
By certifying providers and publishing listings with detailed information on certified property managers, the market becomes more transparent and providers have more incentive to offer high-quality service at reasonable prices. Providers can establish a record of quality and reliability that will enable them to attract better customers and to negotiate with buying consortia. Detailed listings can help property owners save time in the vendor-selection process and help them determine how much they need to budget for maintenance, using aggregated information on average maintenance costs for homes with a given set of features.

In 2004, China regulated the property management industry and introduced a certification scheme for service providers (Exhibit 52). The system sets clear requirements for both vendors and the homeowner associations and other purchasers who use them. For vendors, the regulations set standards for financial capacity, staffing, and other capabilities, and require vendors to publish pricing information. For purchasers, it establishes benchmarks for maintenance budgets by property type. The law also mandates establishment of property-management funds by homeowner associations.

Exhibit 52

Certification can help ensure that O&M vendors have the capabilities to provide services competently and at reasonable cost

Certification process



SOURCE: China Regulation on Property Management; China Rules on Qualifications of Property Management Enterprises; McKinsey Global Institute analysis

USING STANDARDS AND FUNDING TO ENCOURAGE MAINTENANCE AND AVOID DILAPIDATION

Setting (and enforcing) standards for the quality and safety of housing and funding maintenance programs can have a significant impact on the stock of affordable housing. Not only do clear standards force owners to maintain properties in decent condition, but they also can prevent homes from falling into disrepair.

In the United Kingdom, the Decent Homes Standards law, introduced in 2000, set standards for housing in four areas: health and safety, amenities, quality of structures, and thermal comfort. To qualify as “decent,” a home has to be free of health and safety hazards and include a minimum level of amenities, such as a bathroom that is less than 30 years old and a kitchen that is less than 20 years old. There are also standards for placements of water closets and the sizes of entryways. To meet the decency standard, a home has to have a minimum of building components that are old and in need of replacement. To meet the law’s thermal comfort requirement, homes have to have both efficient heating systems and insulation.

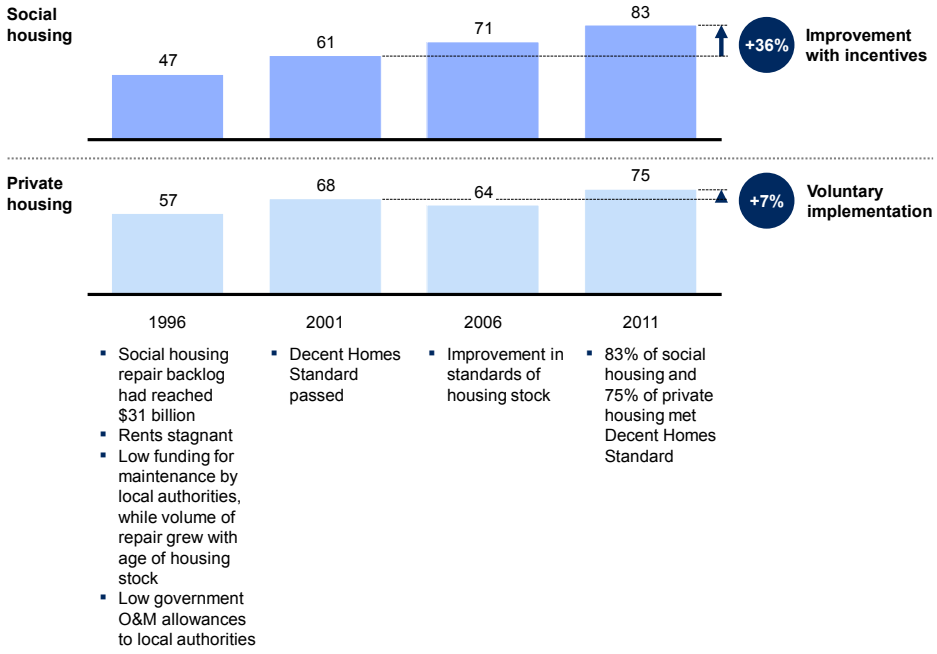
Implementation of the Decent Homes Standards law—along with incentives and funding to help social housing landlords make repairs and renovations—has done a good deal to raise housing quality. In 1996, before the law was enacted, an estimated 47 percent of social housing units met the government's decency standard and there was an estimated $31 billion backlog of needed repairs; the government budget for housing repairs in England and Wales had fallen from $3.8 billion a year to $2.6 billion. In 2001, the allocation for repairs was restored, and by 2011, 83 percent of social housing units met the decency standard—a higher proportion than in privately owned housing (Exhibit 53).

Exhibit 53

With government push—and funding—a greater share of homes in social housing than in private housing met decency standards

UK Decent Homes Standard

Share of housing at standard (%)



SOURCE: English Housing Survey; UK Audit Commission; McKinsey Global Institute analysis

The government encouraged a shift in ownership to social landlords and management through public-private partnerships and provided funding to improve the maintenance of properties that were retained by local authorities or by newly created arm's-length management organizations. Owners and managing partnerships could fund repairs through "major repairs allocations" from the national government, and local authorities were encouraged to choose the most cost-effective option for their tenants and to consult tenants on their preferences. This has led to a sharp rise in the number of homes meeting the decency standard as well as professionalization of social housing management. Similar measures can be used to raise maintenance standards in privately managed housing, but in social housing, standards can be more easily enforced due to reliance on public funding.

Repairs and refurbishment can also be conducted by individual owners or small-scale landlords to address issues of dilapidation or inefficiency. For example, in Indonesia, the Kampung Improvement Program, a broad-based assistance program for residents in low-income neighborhoods, provides modest funds and training for upgrading individual homes. Many homes in very low-income neighborhoods are built by residents and, with some resources and training, the residents can upgrade substandard units. In the United States, some cities offer tax relief or modest grants to encourage low-income residents to upgrade dilapidated or substandard homes. Canadian housing authorities also provide forgivable loans to low-income households to undertake major repairs (less than $23,000) directly related to issues of health and safety.[66]

Expert insight

Benjamin T. Metcalf, deputy assistant secretary, US Department of Housing and Urban Development (HUD)

Q: How does aging stock affect the affordable housing challenge in places like the United States?

A: Aging stock is a critical factor in the affordable housing challenge. In the last 15 years, the United States has lost at least 170,000 affordable homes to sale or demolition. One way to prevent losses is to rehabilitate properties. Under a new HUD program, public-housing authorities and other owners of certain "legacy" fully federally subsidized apartment buildings may convert their existing HUD funding to a Section 8 rental assistance contract, which allows the owners to obtain debt and equity financing for housing preservation and recapitalization.

HUD has already given initial approvals to owners of 60,000 units, who will undertake nearly $2 billion in capital repairs with private debt and equity. Since the launch of the program, HUD has closed or converted 58 projects with over 5,000 units. Many of these projects are getting mortgages and equity investment for the first time. Concerns have been raised about the long-term implications for tenants and the public trust, but long-term use agreements ensure that lenders have to maintain affordability in the event of foreclosure. And tenant protection requirements ensure that tenants have the right to return to refurbished units and there will be no net reduction in the number of units. If Congress takes action to extend the program in its fiscal year 2015 spending bill, HUD will be able to issue commitments for an additional 125,000 units of housing that have applied to date.

66 City of Prince Albert, *Housing Plan*, December 2012.

Expanding access to lending and reducing financing costs can help buyers and developers of affordable housing

Access to financing at reasonable cost is essential for enabling lower- and middle-income citizens to purchase homes. It is also critically important for making investments in affordable housing attractive to developers and landlords, both for the creation of new housing and for refurbishing and maintaining existing housing. Here, we examine housing finance in three ways: helping expand access to mortgages and reducing mortgage costs for home buyers, methods for reducing the cost of financing for developers, and programs to contain or reduce rents for low-income groups. We devote particular attention to homeowner finance, which is a critical tool for helping households secure affordable housing, in both developed and developing economies.

FINDING WAYS FOR HOMEOWNERS TO FINANCE HOME PURCHASES

Housing finance policy is driven by macroeconomic considerations: housing accounts for half of all household wealth in many countries, including the United States. Changes in housing costs and values have direct effects on consumption, and the performance of the housing market is closely associated with economic cycles.[67]

This has led to a long history of government programs to expand access to housing by making financing more available. Government programs include interventions such as mortgage loan guarantees and mortgage-interest deductions on income taxes, as well as broad tax and monetary policies that determine what a mortgage will cost and who will have access to housing finance. Professional groups such as industry associations set property-valuation standards, and private-sector players such as banks and credit bureaus determine how efficient the home loan market is and what it costs consumers. Importantly, just as macroeconomic conditions influence housing finance costs, housing finance plays a large role in the economy (see Box 7, "Housing finance—a cautionary note").

Access to housing finance is a critical tool for making housing affordable. A mortgage allows families to acquire decent housing without having to wait to accumulate savings to buy a home. And an efficient housing finance regime increases housing demand, which encourages builders to produce more and better housing. Where home financing is underdeveloped, the housing construction industry is as well, and often homes are only built piecemeal, as families can afford to add on, and using substandard materials.

67 Matteo Iacoviello, *Housing wealth and consumption*, Board of Governors of the Federal Reserve System, International Finance discussion paper number 1027, August 2011.

Box 7. Housing finance—a cautionary note

The global financial crisis of 2008 had its roots in housing finance, and the world economy still suffers from the aftermath. But it was only one in a long series of housing-related bubbles, crashes, and financial crises that have roiled nations around the world with astounding regularity; according to the International Monetary Fund, these crises occur at least once every 15 years.[1] The effects of housing crises, which include depressed consumption and employment, last for nearly five years on average and result in a GDP drop of about 8 percent.[2]

The housing market is particularly susceptible to bubbles for several reasons, including a lack of knowledge and transparency in the market. Homes sell for what buyers are willing to pay, based on incomplete information. Value is determined largely from the sale price of similar homes, rather than by objective assessment. So, when prevailing prices begin to rise, so do expectations of further increases, leading to speculation. Loose lending standards can fuel speculation. The bubble expands as homeowners are induced to use the gains in their homes to trade up to costlier homes, creating an unsustainable spiral that inevitably leads to a devastating crash.

Given the risk of bubbles and crashes, housing finance policy must be carefully crafted to avoid systemic risk. On a macroeconomic policy level, it is important to monitor house prices and their relationship to income and debt levels. The approaches laid out in this chapter need to be carefully assessed against systemic risk in any country where they are employed.

1 Thomas Helbling and Marco Terrones, "When bubbles burst," in *World Economic Outlook: Growth and institutions*, International Monetary Fund, April 2003.

2 Ibid.

Financing systems in developing economies are not well developed

In developing economies, mortgage-finance systems are underdeveloped, which limits access to housing finance and contributes to higher borrowing costs. Moreover, due to a number of factors such as monetary policy and macroeconomic conditions (especially higher inflation risk), mortgage rates are much higher in developing economies than in advanced economies. In Nigeria, the interest rate hovers around 20 percent, five times prevailing rates in France, Germany, and the United States.[68]

Around the world, low-income households pay significantly higher mortgage rates than high-income households, but the spreads are larger in developing economies (Exhibit 54). Low-income borrowers pay more because banks require significantly higher risk premiums, given such factors as relative instability of income and a lack of data for assessing creditworthiness compared with higher-income borrowers. Costs are also higher for low-income borrowers because their loans are smaller and origination fees do not scale—every borrower pays a similar amount, which is built into the monthly payment, so while origination costs add a relatively small amount to payments for wealthy borrowers, they can help make payments harder to keep up with for households borrowing smaller amounts.

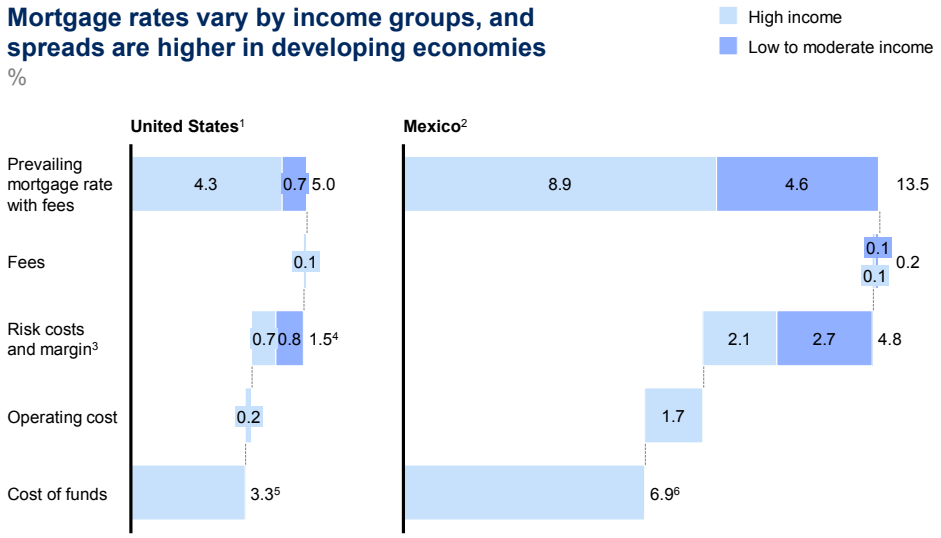
Low-income borrowers also get less benefit from the home mortgage interest deduction than higher-income households. High-income households have a much higher tax exposure, and large mortgage interest expense deductions can help reduce tax burdens considerably. In effect, the policy provides a subsidy to high-income households and reduces the relative cost of purchasing expensive homes.

68 International Deposit Rates Exchange.

Exhibit 54

Mortgage rates vary by income groups, and spreads are higher in developing economies

%



1 Prevailing rate for high income households is 4.3% and 5.0% for low- and moderate-income households.
2 Prevailing rate for high income households is 8.9% and 13.5% for low- and moderate-income households.
3 Includes margins charged for risk premium and economic profit.
4 Includes mortgage insurance risk premiums and Federal Housing Administration subsidies.
5 Reflects 30-year Treasury note rate with negligible capital charge due to prevalence of securitization in the US mortgage market.
6 Blended seven- and 10-year bank note rate plus a capital charge of 50 basis points.

SOURCE: Banxico; Comisión Nacional Bancaria y de Valores (CNBV); McKinsey Global Banking Pools; Fannie Mae; US Treasury; McKinsey Global Institute analysis

Qualifying for a mortgage—or any type of credit—can be very difficult for consumers in developing economies. A large percentage of households remain "unbanked," without access to checking accounts or any formal form of credit (Exhibit 55). Lower-income households have little chance of accumulating savings for a down payment, and therefore require loans with higher loan-to-value (LTV) ratios, which are riskier and therefore more costly loans. In developing economies, financial markets are still evolving and banks may lack the access to funding for mortgage lending from capital markets. Underwriting itself is complicated by the lack of conventional data (verifiable incomes, credit scores) about borrowers in developing economies. With limited access to formal mortgage lending, families in places such as India and Eastern Europe resort to informal lending, sometimes at usurious rates upwards of 60 percent annually.[69]

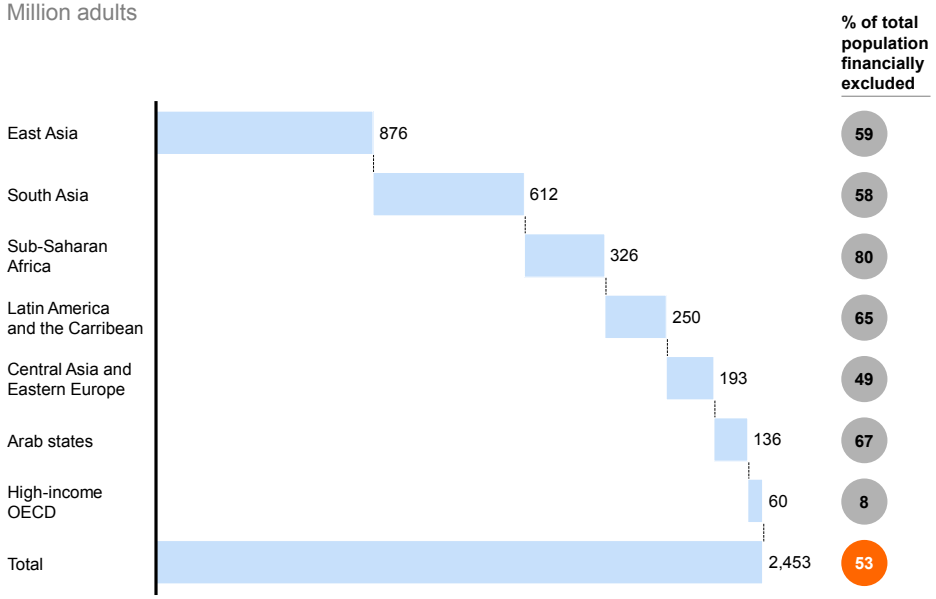
While mortgage rates are lower in advanced and transitioning economies, access to housing finance can be challenging in wealthier nations, too. In South Korea, for example, stringent loan-to-value limits (loans for more than 50 percent of home value are rare) force households to seek sources of financing in addition to mortgages to cover purchases (Exhibit 56). In the United States, where loose underwriting rules helped raise homeownership rates to record levels, lending to low- and moderate-income households fell sharply after the 2008 financial crisis.

69 *Study on interest rate restrictions in the EU: Final report*, Institut für Finanzdienstleistungen and Zentrum für Europäische Wirtschaftsforschung, 2010.

Exhibit 55

More than 50 percent of the world's adults are unbanked and "financially excluded"

Adults who do not use formal financial services[1]
Million adults

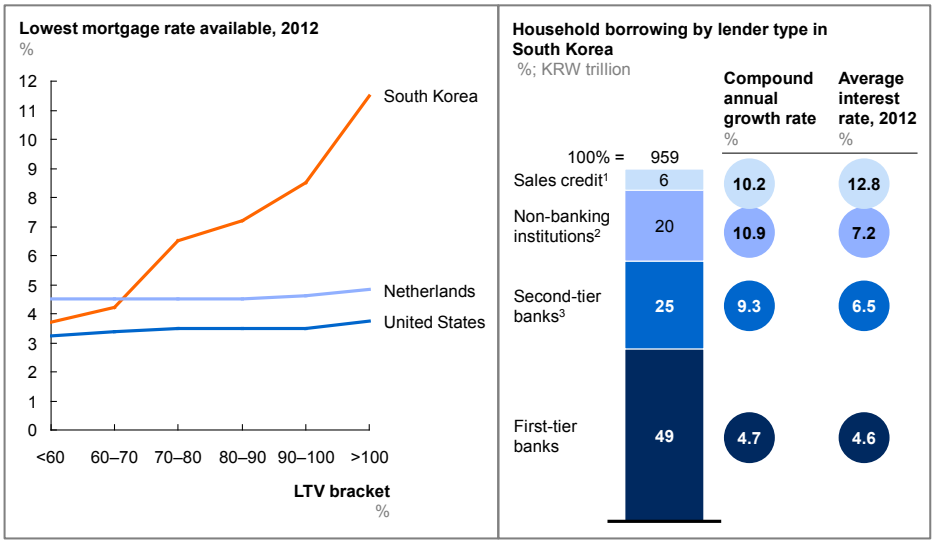


1 Regional groupings based on UN Human Development Index.
NOTE: Numbers may not sum due to rounding.
SOURCE: Joint research by McKinsey and the Financial Access Initiative, 2009; McKinsey Global Institute analysis

Exhibit 56

In South Korea, strict loan-to-value (LTV) limits force households to seek additional sources of housing loans

Because premiums on high-LTV mortgages are so high … **… households need additional loans to fund housing**

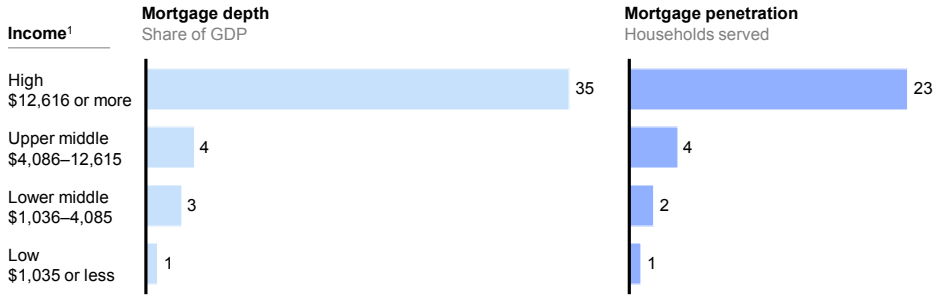


1 Specialized lenders, department stores, auto companies.
2 Insurers, pension funds, specialized lenders (credit card companies, capital companies), public financial institutions, brokerage firms (securities companies, asset liquidation companies, lenders).
3 Such as mutual savings banks, cooperative credits, Saemaeul (rural development) savings, post office.
NOTE: Numbers may not sum due to rounding.
SOURCE: Mistermoney.nl; bankrate.com; NICE report; expert interview; Bank of Korea; McKinsey Global Institute analysis

How housing finance evolves

As economies develop, so do mortgage markets. The maturity of a nation's housing-finance system is indicated by the size and reach of its mortgage market. The role of housing finance in advanced economies is far larger, in terms of both maturity and reach, than in low- and middle-income nations, with total mortgage debt averaging more than a third of GDP (Exhibit 57).

Exhibit 57
Mortgage depth and penetration are far higher in high-income nations
%



1 Using World Bank definitions for country income groups based on annual household income benchmarks, USD.
SOURCE: Anton Badev et al., *Housing finance across countries: New data and analysis*, World Bank policy working paper number 6756, January 2014; McKinsey Global Institute analysis

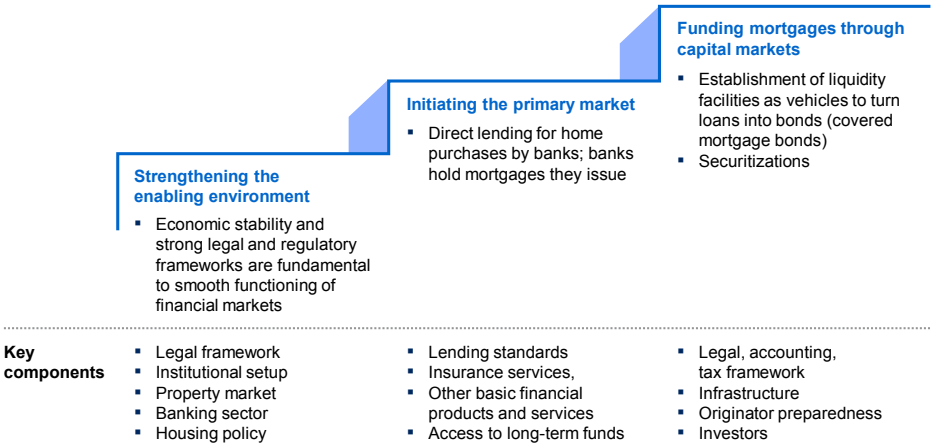
Economies do not automatically develop mature financial markets: a well-functioning housing finance sector evolves in three conceptual stages: strengthening the enabling environment, initiating the primary market, and then funding mortgages through capital markets (Exhibit 58). In practice, governments often try to move in parallel, establishing capital market funding solutions while a backlog of issues in the enabling environment remains. Strengthening the enabling environment—creating appropriate legal, regulatory, and tax regimes—is crucial for a smoothly functioning mortgage market. This includes efficient land titling and registration systems to enable real estate transactions and mortgage issuance. A stable macroeconomic environment in which inflation remains under control is particularly important—and a common challenge in developing economies (see Box 8, "Managing the impact of inflation").

Another factor to consider is the foreclosure process. Lengthy and cumbersome foreclosure processes limit lender appetite to enter the housing finance market. Research shows that an efficient system of mortgage collateral increases mortgage lending activities.[70]

Once the enabling environment is set, the primary mortgage market can develop, which will provide the foundation for lending and additional liquidity in the system to fund home loans. Any efforts to improve the environment for housing finance are likely to have direct impact on the affordable housing segment since in most cases mortgage markets are already responsive to high-income households.

70 Loïc Chiquier, Oliver Hassler, and Stephen Butler, "Enforcement of Mortgage Rights" in *Housing Finance in Emerging Markets*, Loïc Chiquier and Michael Lea, eds., The World Bank, June 2009.

Exhibit 58
Three steps to developing a housing finance sector

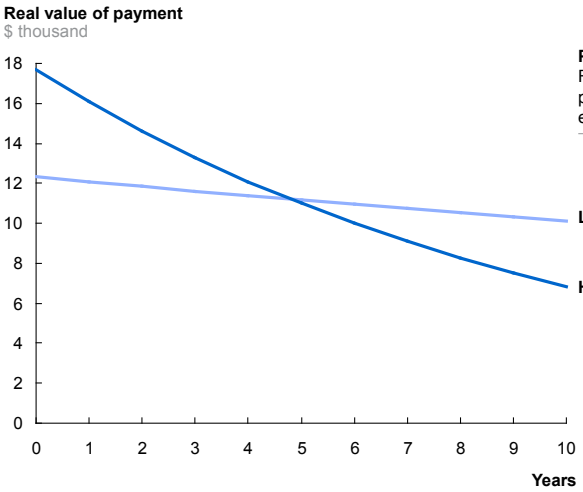

Strengthening the enabling environment
▪ Economic stability and strong legal and regulatory frameworks are fundamental to smooth functioning of financial markets
Initiating the primary market
▪ Direct lending for home purchases by banks; banks hold mortgages they issue
Funding mortgages through capital markets
▪ Establishment of liquidity facilities as vehicles to turn loans into bonds (covered mortgage bonds)
▪ Securitizations
Key components
▪ Legal framework
▪ Institutional setup
▪ Property market
▪ Banking sector
▪ Housing policy
▪ Lending standards
▪ Insurance services,
▪ Other basic financial products and services
▪ Access to long-term funds
▪ Legal, accounting, tax framework
▪ Infrastructure
▪ Originator preparedness
▪ Investors

SOURCE: International Finance Corporation; McKinsey Global Institute analysis

Box 8. Managing the impact of inflation

Inflation (and the expectation of long-term inflation) drives up interest rates in a country and raises nominal mortgage rates. Over time, inflation pushes up wages and the real value of the principal in a mortgage declines (Exhibit 59). But low-income households may not be able to cope with the initial years of high interest payments since their wages may not grow with inflation. Furthermore, banks shift the inflation risk to borrowers with variable-rate mortgages, which can subject low-income households to sudden spikes in payment costs, or simply price inflation risk into a higher rate.

Exhibit 59
In high-inflation scenarios, higher real value payments in early periods are offset by lower real value payments in later periods



Principal of $100,000 paid over 10 periods
Fixed-rate mortgage in which nominal value of payment is the same throughout and equivalent to the payments made in period 0

	Mortgage rate	Inflation rate
Low-inflation scenario	4%	2%
High-inflation scenario	12%	10%

SOURCE: McKinsey Global Institute analysis

THREE APPROACHES CAN MAKE MORTGAGES MORE ACCESSIBLE AND LESS COSTLY

Once a mortgage market is established—and even as it is developing—nations can take steps to ensure that their markets serve buyers of affordable homes. We find three major approaches can expand access to mortgage financing and cut mortgage costs for low- and middle-income citizens: reducing the costs of originations, reducing the costs of funding private-sector mortgages, and tapping collective savings (such as state-sponsored retirement saving systems) to fund mortgages (Exhibit 60).

Exhibit 60

Three main policy themes for improving access to home financing for buyers of affordable housing

Themes	Tactics	Relevant for countries with: Emerging primary markets	Relevant for countries with: Strong primary markets[1]	Select country examples
Reduce loan origination costs	Improve assessment methods to qualify borrowers	●		▪ India ▪ South Africa
	Introduce standardized property valuation methods	●		▪ Poland ▪ Romania ▪ South Africa
	Initiate mortgage-guarantee schemes	●	●	▪ United States ▪ India
Reduce cost of funding mortgages	Establish liquidity facilities	●		▪ Colombia ▪ Malaysia ▪ Jordan
	Expand capital market funding (with covered mortgage bonds or mortgage-backed securities)	●	●	▪ Denmark ▪ Germany ▪ Spain
	Increase use of core deposits	●	●	▪ United Kingdom
Leverage collective savings to reduce rates	Launch housing provident fund	●		▪ Singapore ▪ Mexico
	Offer contractual savings schemes	●	●	▪ France ▪ Germany ▪ Kenya

1 In the primary mortgage market, lenders originate loans directly with borrowers.
SOURCE: McKinsey Global Institute analysis

Reducing the cost of loan originations

The cost of a housing loan is determined largely in the underwriting process, during which lenders assess the risk associated with the loan and price the loan accordingly. The risk to the lender can be gauged more precisely and the risk premium can be reduced in underwriting when more is known about the borrower and the property. This requires access to reliable data about the borrower's ability and willingness to pay, such as a rating from a credit bureau—and reliable property records to determine the value of the property. Finally, origination costs can be reduced when there is some type of guarantee that the lender will be protected in case of default, which means that the cost of defaults does not have to be built into loans.

Assessing borrower income and credit

The essential challenge in mortgage underwriting is judging the quality of the borrower and the collateral. In advanced economies, relevant data about consumers is collected by credit bureaus, which generate objective credit scores that banks can rely on as a general indication of creditworthiness. In developing economies, many consumers are unbanked, and many—particularly in lower-income segments—may work in the informal economy. For these consumers, there may be no banking records, pay stubs, or credit-card payment histories.

There are two ways to fill the information gap needed to assess borrowers more accurately in developing economies. First, governments can work with the private sector to create a credit bureau system. Second, banks can use unconventional data about applicants, such as mobile phone payment records, to assess credit risk.

Credit bureaus benefit both lenders and borrowers by allowing consumers to prove their creditworthiness and helping banks avoid underwriting errors.[71] According to one study in Argentina, effective credit bureaus reduced default rates by 41 percent for large banks and 79 percent for small banks.[72] Another study showed that the presence of a credit bureau could raise the ratio of private credit to GDP in an economy by seven to eight percentage points in five years.[73]

Establishing a credit-bureau system is a significant undertaking, requiring access to reliable data, sophisticated IT systems, a governance system, and a regulatory framework that protects borrower privacy. Mandatory participation by banks in national credit bureaus is critical to success. The participation of the largest market players is also a pre-requisite: the top lenders will be both major customers and sources of data, and their support will give the system credibility. A major bank, however, might hesitate to share data with smaller banks, assuming it has little to gain from what small lenders know. Therefore, mandating participation is critical to avoid a prolonged adoption period.

With big data analytics, it is increasingly possible to assess underwriting risk using non-traditional data, such as utility and mobile phone payments. In Africa, for example, one company rates consumers based on how often they top-up prepaid mobile phones. While these approaches have so far mostly been used in lending to small and medium-sized enterprises, application to housing finance is conceivable.

These unconventional data sources can also be used to refine assessments by lenders in advanced economies. McKinsey has found that using such qualitative assessments in addition to traditional criteria can reduce a bank's risk costs by 35 percent.[74]

---

71 Ibid.

72 Andrew Powell et al., *Improving credit information, bank regulation and supervision: On the role and design of public credit registries*, World Bank policy research working paper number 3443, November 2004.

73 Simeon Djankova, Caralee McLiesha, and Andrei Shleifer, "Private credit in 129 countries," *Journal of Financial Economics*, volume 84, number 2, May 2007.

74 Tobias Baer, Tony Goland, and Robert Schiff, *New credit-risk models for the unbanked*, McKinsey working paper on risk, number 30, March 2012.

Property appraisal

Property assessment is relatively sophisticated in advanced economies, where there are professional assessors and a wealth of data about property prices. Developing economies typically lack well-trained appraisers or the capacity to train new ones. In some countries, there is outright fraud in property appraisal. Inaccurate appraisal values—both overestimates and underestimates—have serious implications on prices paid as well as on assessments of loan applications and the size of mortgages provided.

To build a reliable system for property appraisal, governments can work with professional associations that train appraisers and regulate their activities. Only appraisers who are certified by such a group or by the state should be allowed to perform appraisals. Associations can also determine fee structures, which must be designed to avoid perverse incentives (inflating property values to raise fees, for example). Furthermore, governments should work with financial institutions and the real estate industry to create a database of property transactions to inform assessments.

Poland and Romania established robust appraisal industries in the early 1990s by using donor technical assistance, joining international appraisal organizations, and adopting US and UK standards for licensing, education, and on-the-job training. Advances in information technology can also help developing economies catch up quickly in property appraisal and other forms of data gathering needed for efficient mortgage markets (see Box 9, "The role of technology"). They may also benefit from the global effort to standardize property appraisal and create a global certification program. These standards are increasingly necessary as cross-border investments in mortgage securities rise.

Box 9. The role of technology

Digital technologies have already had enormous impact on the financial services industry, including in mortgage lending in advanced economies, and now can help expand access for lower-income borrowers in developing economies. The mobile Internet is connecting hundreds of millions of people in developing economies to the Web, extending access to banking services to places where there are no bank branches. With smartphones and mobile payments, unbanked consumers can open bank accounts, start building savings, and establish credit.

Advances such as big data analytics and "expert systems," which attempt to replicate the knowledge and judgment of an expert, can help lenders refine underwriting and marketing operations. Big data analytics can help lenders uncover profitable new subsegments, including among low- and middle-income populations. Online loan application systems—or call centers with operators using expert systems—can streamline the loan application process and, potentially, reduce costs for borrowers. The Industrial and Commercial Bank of China estimates that an online transaction entails only one-seventh the cost of a transaction at a branch counter.[1]

For cities, the proliferation of relatively low-cost digital technologies makes it possible to create electronic land records that can be accessed and searched remotely—ending the costly process of going to a government office to verify title information. Comprehensive public databases of property transactions also make the appraisal process far simpler, enabling appraisers to quickly see prices for comparable properties, for example.

1 Annual report, Industrial and Commercial Bank of China, 2012.

Mortgage guarantees

Mortgage guarantees—by government or private insurers—provide protection to lenders in case of default, substantially reducing underwriting risk. While insurance raises costs of borrowing, borrowers benefit by being able to receive loans earlier at higher LTV ratios, rather than waiting to accumulate savings for higher down payments. This can be particularly helpful where rapid increases in income are expected.

A mortgage guarantee (known as a mortgage indemnity guarantee in the United Kingdom) compensates lenders and investors for losses due to defaults. As with other insurance schemes, the beneficiary must pay a premium, but with mortgage guarantees the cost is passed from the beneficiary (the lender) to the borrower. In the United States and some other countries, the cost of government mortgage guarantees has been waived for certain groups as a subsidy. For example, in the United States, veterans as well as low-income families qualify for discounted loans based on such waivers.

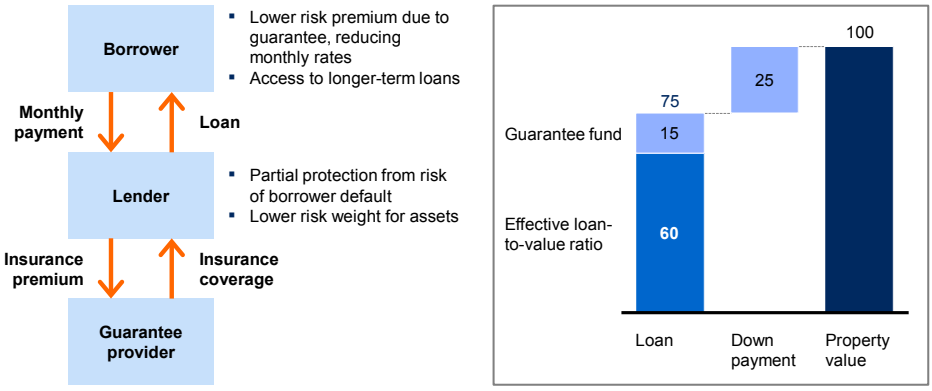
Mortgage guarantees can mitigate risks for mortgage issuers and help borrowers. However, the US subprime mortgage crisis underscores the inherent dangers if guarantees lead to imprudent lending standards or encourage borrowers to take out larger loans than they can afford to pay off (Exhibit 61).[75] Still, properly designed and regulated mortgage-guarantee systems could help developing economies expand access to home financing. The challenge is to calculate the appropriate premiums for mortgage guarantees, which is a data-intensive and costly process. In a private insurance scheme, the cost of the premium would go into the cost of the loan, which would raise costs and risk for low-income borrowers. A publicly backed mortgage insurer would usually absorb the risk premium, rather than passing it on to the borrower, and could specifically support access to housing finance for low- and moderate-income households.

Exhibit 61

Mortgage guarantees can reduce obstacles to financing and reduce rates for borrowers—with the proper safeguards

Example: Mortgage guarantee fund

%



NOTE: Guarantees of $3.3 billion (20% of total disbursements of $16.5 billion); at a compound annual growth rate of 12%, this will require $400 million.

SOURCE: Expert interviews; press search; McKinsey Global Institute analysis

75 Roger Blood, "Mortgage insurance," in *Housing finance for emerging markets*, Loïc Chiquier and Michael Lea, eds., World Bank, June 2009.

Funding mortgage portfolios more efficiently: how raising market liquidity can lower costs

The way that mortgages are funded has a great deal to do with what they cost and how widely available they can be. Mortgages can be funded by bank deposits, and, where financial markets are less developed, this is usually the only source of mortgage capital. Where strong primary mortgage markets exist, secondary markets develop, in which mortgages are funded by investors who buy bonds or other securities based on loan portfolios. Secondary mortgage markets provide liquidity and give lenders access to more capital for lending. They can also be an attractive vehicle for investors seeking safe, guaranteed returns. But as the financial crisis demonstrated, without proper precautions and transparency into the value of the underlying loans, mortgage-backed securities can become quite risky.

Here we look at three ways to bring more capital into mortgage markets to expand access to finance, disperse risk, and reduce costs. The first is the mortgage liquidity facility, which has been popular in all geographies and has been especially successful in expanding access to home finance in Malaysia. The second is expanding the role of capital markets, including mortgage-backed securities or covered mortgage bonds, a form of securitization that has been adopted throughout Europe. The third funding mechanism is greater use of core deposits—more effectively using the assets that banks already have.

Liquidity facilities can expand access to mortgage funding and reduce rates

If a country's primary lending markets are sufficiently developed, governments may consider establishing or expanding secondary market institutions to open up new funding channels, help manage and reduce risk, and support the primary mortgage market. A mortgage liquidity facility is an instrument for creating a secondary market by making wholesale loans to banks based on their loan portfolios or purchasing the portfolios. In either case, the loans are turned into bonds, which may be backed up with government guarantees. In this way, liquidity facilities resolve the maturity mismatch between the long maturities of primary mortgages and the shorter terms that bond investors seek, opening up a new source of funding for mortgages.[76]

Liquidity facilities spread the risk and raise market liquidity, so mortgages can be more widely accessible and offered on better terms than if mortgage lenders were acting alone. Liquidity facilities have been shown to encourage expansion of affordable housing finance and have been used as part of national policies to increases homeownership. Liquidity facilities also can be very helpful when mortgage lenders face a challenging situation, as in the case of Malaysia (see Box 10, "Restoring liquidity in Malaysia").

76 Olivier Hassler and Simon Walley, "Mortgage liquidity facilities," *Housing Finance International*, volume 22, issue 2, December 2007.

Box 10. Restoring liquidity in Malaysia

In 1987, following a recession and liquidity crunch, the Malaysian government chartered Cagamas, the national mortgage corporation. It had two objectives: expanding mortgage lending by providing primary lenders with access to short-term funds using mortgages as collateral, and helping build a Malaysian bond market by offering products to attract new investors. In doing so, Cagamas reduced market risks, helped finance social housing, sustained the construction sector, and developed private, fixed-income markets (Exhibit 62). In the process, Cagamas has encouraged more home lending has increased homeownership rates.

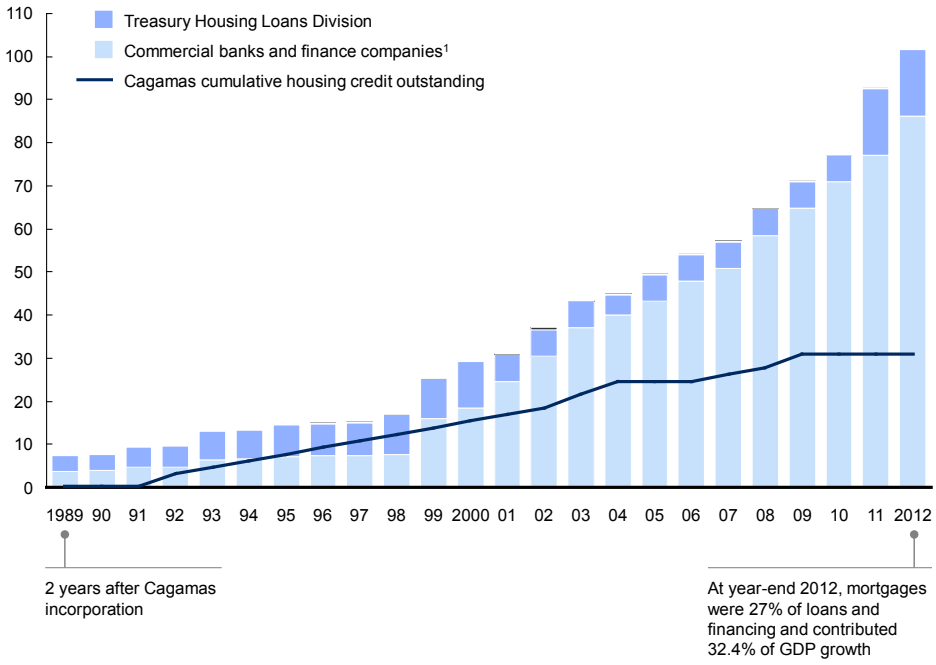
To achieve its goals, Cagamas relies on several quasi-subsidies; loans sold to Cagamas are not subject to the central bank's reserve requirements, and its securities can be counted as liquid assets. Throughout its existence, Cagamas has been profitable and has become the leading issuer of debt in Malaysia. Its securities are rated AAA by the Malaysian Rating Corporation.[1]

Exhibit 62

Malaysia's Cagamas is responsible for a significant share of home financing

Housing credit outstanding (cumulative)

$ million



1 Others inclusive of Bank Kerjasama Rakyat Malaysia Berhad, Borneo Housing Mortgage & Finance Berhad, Bank Simpanan Nasional, and Sabah Credit Corporation.

SOURCE: Cagamas annual reports, various years; McKinsey Global Institute analysis

1 Kokularupan Narayanasamy, "Cagamas has shown the way," *Asia-Pacific Housing Journal*, volume 5, number 16, July–September 2013.

Tapping capital markets: Covered mortgage bonds and mortgage-backed securities

Covered bonds are debt instruments secured by a pool of mortgages to which the investor has a preferred claim in the event of an issuer default. In EU countries, the issuance of covered mortgage bonds is regulated by laws that define the criteria for eligible assets as well as other specific requirements, providing additional protections that other mortgage-backed securities do not offer. Covered mortgage bonds are growing in popularity among investors due to their relatively high returns and safety.[77] Since the 2008 financial crisis, they have received more global attention from investors as a safer form of securitization.

Unlike other mortgage-backed securities, covered bonds remain on the issuer's consolidated balance sheet (usually with an appropriate capital charge). In the case of default, the investor has recourse against the issuer and the collateral, which is why covered mortgage bonds have been termed "dual recourse" instruments. Moreover, in the case of default, the investors remain general creditors of the bank, which provides them extra protection and reduces their risk. The covered mortgage bond market is well-established in Europe (Exhibit 63).

From a lender's perspective, covered mortgage bonds are a stable funding source and are attractive as a tool for asset/liability management. In developing and transitioning economies, the ratings gap between average long-term commercial bank debt and residential and commercial mortgage assets creates incentives for institutions to raise funds through covered mortgage bonds.

While covered mortgage bonds are usually geared to low-risk mortgages, they have an important indirect role in affordable housing finance. If banks can fund low-risk mortgages with covered bonds, they have capacity on their balance sheets to make loans to lower-income households.

Mortgage-backed securities remain an alternative. These instruments are created by pooling loans with different risk profiles and packaging them for sale to investors. Such securitization has brought tremendous liquidity to mortgage markets, but unlike covered mortgage bonds, the underlying assets are removed from the issuer's balance sheet, making them riskier. Mortgage-backed securities were developed in markets with sophisticated investors, often institutions, and have not been used extensively in developing economies.

When nations consider mortgage securitization as a way to raise liquidity and lower costs, a few precautions should be taken.[78] First, the issuance of securities should match basic lending standards in the primary markets. Second, the lending bank should retain and share some of the risk of the mortgage-backed security, rather than separating the risk from the original issuer, which has been common practice. Third, the securities should be repackaged only in ways that enable investors and lenders to continue to monitor and manage risk.

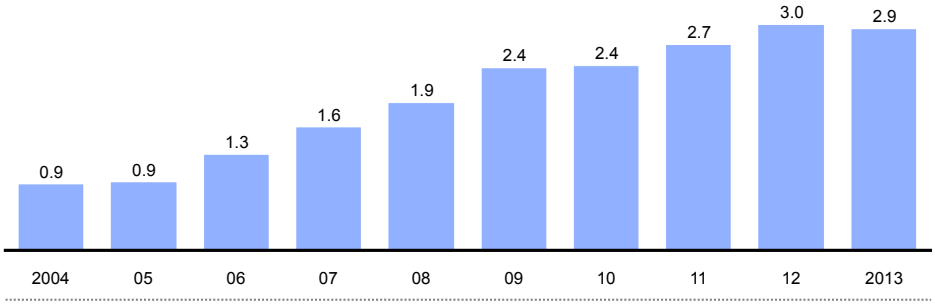
77 Renzo F. Avesani, Antonio Garcia Pascual, and Elina Ribakova, *The use of mortgage covered bonds*, IMF working paper number 07/20, January 2007.

78 Ibid.

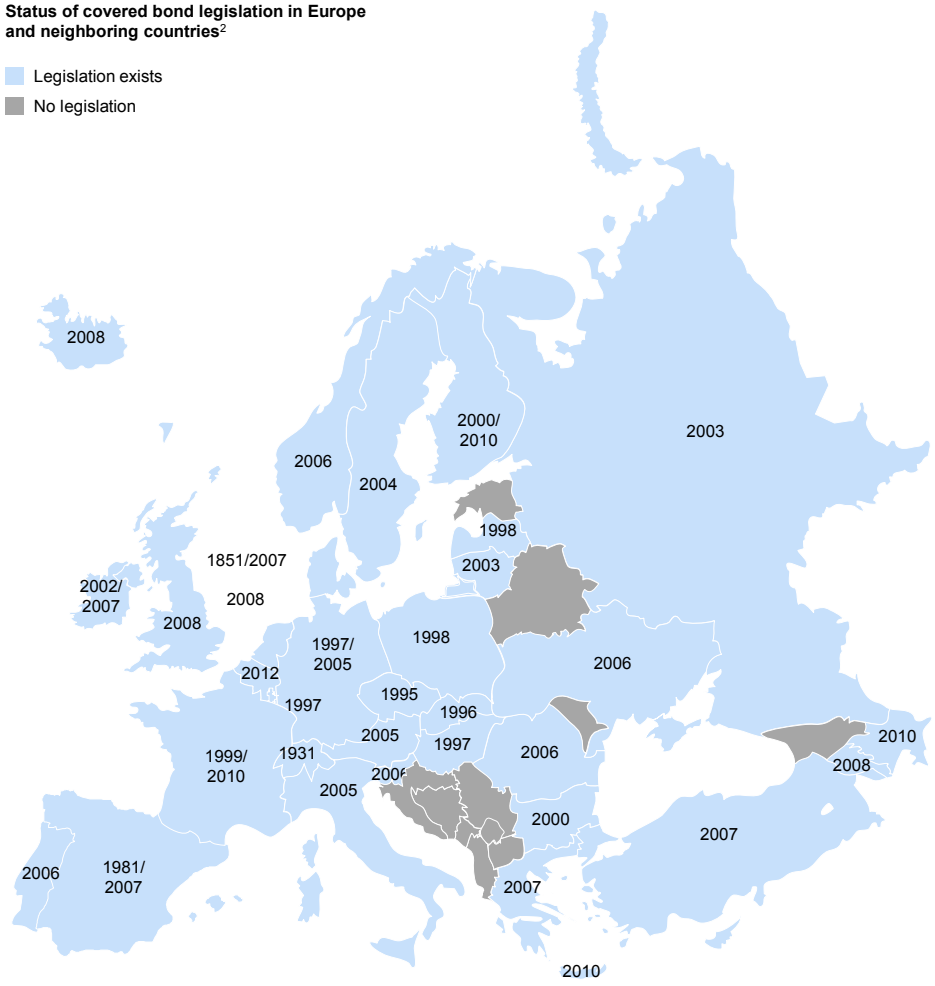
Exhibit 63

Covered mortgage bonds have become an important source of housing finance funding in greater Europe

Total outstanding mortgage covered bonds by underlying assets, 2004–13
$ trillion[1]



Status of covered bond legislation in Europe and neighboring countries[2]



1 Using year-end exchange rate.
2 As of December 2013.

SOURCE: European Covered Bond Fact Book, 2014; McKinsey Global Institute analysis

Greater use of core deposits

Banks have two main approaches for funding mortgages—the "traditional" route of using their deposits and the "market-based" approach of tapping capital markets. Traditional banks use their core deposits to fund "information-intensive" loans to borrowers in their communities or markets. They are information-intensive because deposit-taking gives banks additional information about potential borrowers in their customer bases through checking account behavior. Traditional banks also have more general information about the local market through their local branches.[79] Lenders can lengthen the duration of liabilities based on core deposits by encouraging long-term deposits by offering accounts in which the interest rate rises the longer the customer keeps funds on deposit. Ultimately, however, banks that rely solely on core deposits remain constrained in terms of lending capacity. A market-based bank, by contrast, uses shorter-term debt and brokered deposits ("managed liabilities") to fund less information-intensive loans (generally to higher-income households) and is less constrained in its lending capacity.

If policy makers believe that more core lending is a good way of helping improve access to home loans for under-served consumers, there are implications for monetary policy. Tight money supplies force banks to rely more heavily on managed liabilities, which are both more expensive (due to the cost of funds) and provide less local information.[80]

Reduce rates by leveraging collective savings

As noted, high LTV ratios are a major source of mortgage-lending risk. Consumers in need of affordable housing often lack the savings for a down payment to reduce LTVs to safe levels. However, there are saving schemes that can help reduce LTVs, as well as interest rates for consumers of limited means. These mechanisms include contractual savings plans and provident funds.

Contractual savings for housing

Group savings plans can reduce the cost of borrowing for households and provide mortgage financing. Members of these schemes make regular mandatory contributions to a savings fund, from which they then withdraw to make down payments on homes. The savings fund also issues loans to members. Members receive a low rate of return on their savings but get a discounted rate on mortgages. Funds can end when the last household withdraws its funds, or they can continue on a rolling basis with new members. A closed contractual saving system is funded exclusively by member savings; an open system also uses funding from external sources. In an open system, the state often provides funding to help support preferential lending for low- and moderate-income households. However, this subsidy needs to be carefully managed to avoid market distortions—for example, by driving up housing prices.

79 Leonard I. Nakamura, "Commercial bank information: Implications for the structure of banking," in *Structural Change in Banking*, Michael Klausner and Lawrence J. White, eds., Business One Irwin, 1993.

80 See also Lamont Black, Diana Hancock, and Wayne Passmore, *Core deposit funding of subprime mortgages and the effect of monetary policy*, presented at Center for Applied Research in Finance conference on "Business Models in Banking: Is There a Best Practice?" in Milan, Italy, September 21, 2009.

Contractual saving schemes worked well in Central Europe in the postwar years. They provided low-cost funding and filled a need that was not met by a conventional mortgage industry. They have also been particularly beneficial as means to provide financial inclusion for young and low-income families, especially those without a credit history or savings for a down payment.

There are some potential downsides to contractual saving systems. They have been proven to work best in times of low inflation since savers accept low rates on their contributions in return for a low rate on housing loans. Inflation, which is a common risk in developing economies, erodes the value of savings and discourages participation in contractual schemes. Closed contractual savings systems are also have limited total lending capacity, which cannot exceed the total amount saved. In recent years, building societies have been in decline globally. For example, the number of building societies in the United Kingdom declined from 59 (with assets of more than $650 billion) in 2008 to 45 in 2014, following the financial crisis, mergers, and demutualizations.[81]

Despite their limitations, contractual saving systems can play an important role in developing economies. They have helped provide long-term funding particularly in the earlier stages of financial market development, when financial systems are not yet well developed and access to long-term funding is limited. They have also helped poor nations promote financial inclusion.

Housing provident funds

Provident funds are similar to contractual savings programs but use money from mandatory saving schemes such as state-sponsored pension plans. Widely used in Mexico and Singapore, provident funds collect contributions from employees and employers, based on a percentage of wages. Workers can withdraw accrued savings for down payments for housing purchases and obtain home loans from the fund. Mortgages are usually provided at a preferential rate that is subsidized by below-market returns on the provident fund savings. Housing provident funds often are used in economies where the private sector does not yet provide long-term housing finance.

Established in 1972, Mexico's INFONAVIT (Institute del fonda nacional de la vivienda para los trabajadores) is a housing provident fund for private-sector employees, who pay 5 percent of salaries into individual savings accounts. INFONAVIT uses deposits to fund subsidized housing loans and also develops housing, purchases land, and hires private-sector contractors. It has become the largest mortgage lender in Latin America, with more than five million mortgages on its books.[82] INFONAVIT is set up to help Mexico address its affordable housing challenge through an explicit mandate to make housing loans to workers earning no more than four times the minimum wage. It offers these workers priority access to mortgages, which carry lower interest rates than loans to higher-income INFONAVIT participants. In Singapore, the Central Provident Fund was established as a pension plan in 1955, and gradually amended to provide low-cost loans funded by below-market returns on the contributions paid in, and to allow withdrawals for housing purposes.

81 Building Societies Association, www.bsa.org.uk.

82 INFONAVIT website.

Housing provident funds have their critics, particularly because of the cross-subsidization of mortgage rates, which benefits consumers who can afford to take out the largest loans. Provident funds have also been accused of favoring certain segments of the population or connected borrowers, rather than providing loans on an equitable basis. They are also viewed as regressive since low-income savers, who forgo high returns on savings, may never get loans. Finally, there are questions about market distortions caused by the presence of massive provident funds.[83]

REDUCING THE COST OF DEVELOPER FINANCING CAN INCREASE THE SUPPLY OF AFFORDABLE HOUSING

Financing represents 5 to 10 percent of total development costs, depending on prevailing interest rates and the risk of a project.[84] In some markets, all land purchase has to be equity funded and this can be as much as 25 percent of project costs. Because projects are typically 80 percent debt, access to credit at competitive rates influences the go/no-go decision, and fluctuations in interest rates have significant effects on financing costs. High or fluctuating rates may delay development, which can lead to land hoarding. Or if developers move ahead, they are more likely to build middle-income or luxury housing, which provides higher profits to cover the higher cost. Governments can help developers gain access to finance and reduce financing by "de-risking" the project, as well as providing subsidies and incentives where needed. For any subsidy scheme, it is important to define a phase-out strategy early on, since abolishing subsidies is typically met with fierce resistance later on.

Four approaches to lowering cost of developer financing or providing subsidies

There are four primary ways to lower the cost of financing for developers: increasing equity, improving debt terms, providing tax relief, or de-risking development, for instance by reducing the time between when construction begins and housing is sold or rented. The first three approaches are essentially subsidies for low-income housing, while de-risking improves efficiency. Selecting the appropriate approach, or combination of approaches, depends on market conditions and government resources. In all cases, developer financing should be carefully tailored to local demand, and developers need to be carefully screened. Overall, developer financing policies should operate on the "but for" principle: but for this assistance, the development would not happen.

Increasing equity

By increasing the equity, the developer can contribute, and by reducing the need for financing—and the project's risk—cities can increase a project's attractiveness to financiers. Programs to increase developer equity include direct non-refundable cash contributions (grants) and indirect non-refundable cash contributions (tradable tax credits that the developer sells to raise capital). Equity contributions, either direct or forgone tax revenue, are the most expensive form of subsidy for cities and should be used judiciously. In the Cosmo City development outside Johannesburg, equity contributions were one of several financing mechanisms

83 Loïc Chiquier, "Housing provident funds," in *Housing finance policy in emerging markets*, Loïc Chiquier and Michael Lea, eds., World Bank, June 2009.

84 Based on cost estimation of multifamily building of 100 square meters per unit, seven units per floor, ten floors.

that were used to close the gap only after other sources were exhausted (see Box 11, "Funding Johannesburg's Cosmo City").

Box 11. Funding Johannesburg's Cosmo City

Cosmo City is a mixed-use development with approximately 12,000 housing units on 1,105 hectares northwest of Johannesburg. The development consists of the 5,000 fully subsidized units for low-income households; 3,000 credit-linked units (purchased by financial institutions and leased or sold to households with monthly incomes of $525 to $2,400); 3,300 market-rate units; and 1,000 social housing rental units.

The project was a public-private partnership, in which the city provided land to the lead developer, Codevco, which developed the land and provided infrastructure outside the parcel, including roads. Other developers provided electricity, water, and other services within the parcel. The scheme used de-risking strategies to reduce the private partner's risk and financing costs. For example, the developer did not have to pay anything for land until a unit was sold to the consumer. Because the city held the unit until a return was guaranteed, the developer did not incur any holding costs, and the city was still compensated for the land.

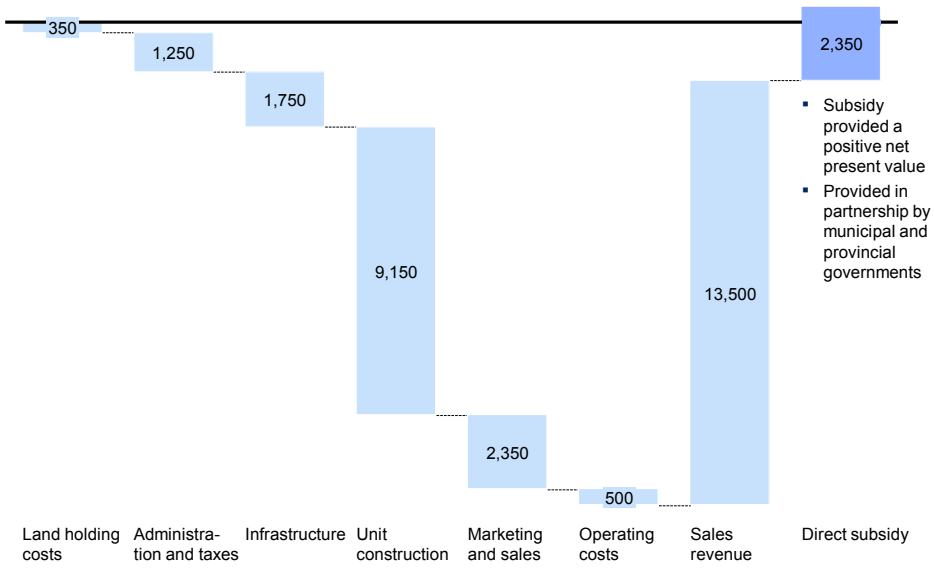
A large portion of the total investment was funded by taxes on the sale of units and the developer's value-added tax payment and the remainder from general tax revenue. The direct government subsidy for low-income units amounted to approximately $15,000 per subsidized unit. Infrastructure and land contributions were worth $7,000 to $14,000 per unit. Households making less than about $150 a month qualified for fully subsidized units; partial subsidies were offered to households earning up to about $2,500. The total government subsidy is estimated at nearly $135 million, which made the economics attractive to the private sector (Exhibit 64).

Exhibit 64

The Cosmo City project included subsidies that generated sufficient return to encourage private development

Estimated cost per unit[1]

$



1 Average across all units.

SOURCE: *Land release assessment tool: Cosmo City case study*, Urban LandMark, 2011; McKinsey Global Institute analysis

Tradable tax credits are another way to increase developer equity. Under the US Low Income Housing Tax Credit program, tax credits are distributed by state housing authorities to developers of qualified projects. The credits are then purchased by investors at a price set by the market, typically 75 to 95 cents on the dollar. The sale of these credits generates capital for the developers of affordable housing, with strict rules about running the low-income units and managing beneficiaries. Investors receive their credits over a ten-year period and receive compensation only if the development succeeds financially. This encourages the investors to act as a quality check on the proposed development, ensuring that properties are built in areas with the highest demand for affordable housing and greatest probability of success.

The Low Income Housing Tax Credit program has been the largest source of developer financing for affordable housing in the United States since the program's inception in 1986. Using this credit, developers have produced more than 2.5 million units of affordable housing and nearly 90 percent of US affordable rental housing construction is funded in part by this tax credit. The program can also be used to fund rehabilitation projects to preserve affordable housing. The program has, however, been criticized for its complexity and for giving excessive subsidies to investors.[85]

Improving debt terms

Debt-based programs increase access to finance or reduce the cost of debt financing, typically through low-interest loans or government-guaranteed loans. While there is risk involved in guaranteeing loans, if developer candidates are carefully selected, this approach can help cities construct more housing.

Since 2013, the United Kingdom has offered nearly $17 billion in loan guarantees to developers through the Affordable Homes Guarantees Programme. The program guarantees developer loans and provides coverage for the most risky phases of development before construction begins. Projects must be targeted at low-income renters or purchasers of affordable homes and must be of significant scale. The UK government also has helped secure nearly $850 million from the European Investment Bank for loans on favorable terms for at least eight local housing authorities. These funding initiatives have been aimed at encouraging more private development of affordable rental housing, an asset class that has not attracted much investor interest. The program is intended to demonstrate that affordable rentals can be a profitable business model, in the hope that this will persuade private investors to enter the market.

In India, developers are looking at ways to tap foreign sources to fund affordable housing under the nation's external commercial borrowing program, which only recently has been approved for affordable housing. External commercial borrowing, which was established to let companies receive foreign funding under strict controls, provides access to lending at rates far below the Indian average. For affordable housing developers, projects (new construction or slum rehabilitation) using foreign funding will have to be approved by the National Housing Bank. So far only one company, Housing Development Finance Corporation (HDFC), has raised funds through this scheme, saving an estimated

85 Karl E. Case, "Investors, developers, and supply-side subsidies: how much is enough?" *Housing Policy Debate*, volume 2, issue 2, 1991; Michael A. Stegman, "The excessive cost of creative finance: growing inefficiencies in the production of low-income housing," *Housing Policy Debate,* volume 2, issue 2, 1991.

100 basis points, even after the costs of additional withholding and hedging needed to use foreign funds.

External commercial borrowing has the potential to provide developers of affordable housing with low-cost funding at little to no cost to the Indian government. However, having to rely on external commercial borrowing can be viewed as an indication of the market failures and lack of options in Indian real estate finance. This borrowing premium affects the housing sector at all income levels and is felt even more strongly when building for low-income households.

Providing tax relief

Governments can reduce developer costs through targeted tax-exempt bonds or tax abatement schemes. Tax-exempt bonds are issued by public entities to fund affordable housing, typically at rates 30 to 35 percent below what a taxable bond would pay.[86] Tax-free bonds can also finance infrastructure for affordable developments.

Tax abatements are offered by governments to encourage private development of affordable housing by offering a full or partial exemption to property taxes for eligible properties. These programs should be highly targeted, so that they encourage development or preservation of affordable units that are in jeopardy, not subsidize standard development projects. France offers developers of social housing a value-added tax rate of 5.5 percent, instead of 20 percent.

De-risking development

De-risking involves interventions by government entities during the development process to reduce risk and, therefore, financing costs. These interventions can be far less costly than direct support. For example, the period between acquisition of land and start of construction is often the most risky for developers since land acquisition is typically financed by equity (their own capital) and permits are not yet approved. By accelerating the permitting process, governments offer a no-cost benefit to developers.

Government can also reduce sales and marketing risks, so developers do not wind up financing unsold properties that are not producing income. Government can absorb sales and marketing risk by agreeing to buy back completed units built by the private partner. Government can also de-risk development by guaranteeing a full roster of tenants or buyers from housing agency waiting lists. In Brazil's *Minha Casa Minha Vida* program, properties developed by approved contractors were marketed to a list of pre-approved, low-income buyers. The returns are limited by a cap on the sale price of the property, but developers and investors carry less risk than in a purely speculative development.

86 Justin Cooper, *Multifamily rental housing: Financing with tax-exempt bonds*, 2nd ed., Orrick Herrington & Sutcliffe LLP, 2010.

Developer financing mechanisms need to be designed with great care

The high cost of most developer financing schemes necessitates selective use and careful oversight. Municipal, state, and national governments have to allocate significant funds for subsidies. And even low-cost de-risking strategies require great coordination between authorities. Careful attention to two areas will help generate political support for developer financing:

Oversight

Strong oversight mechanisms are needed to regulate the subsidy and prevent abuses. Qualified developers should have a track record of success and proven ability to obtain the private funding for the project. By staggering subsidies, developers can get a guaranteed cash flow (or equivalent) and governments can maintain control by setting clear milestones to be achieved before additional support is provided. Penalties can be imposed for missed deadlines or subpar construction. Even after projects are completed, regular audits and other measures are necessary to ensure units remain affordable at the levels specified by government.

Demand considerations

Subsidies to increase the supply of housing need to be sensitive to demand—quantity, quality, and location—to avoid creating a surplus of housing or an unnecessary subsidy. For example, in the Cosmo City development, the prices of units targeted toward middle-income households had to be adjusted after an economic slump reduced the pool of qualified applicants. Developer subsidies should fit closely with market mechanisms and adjust to fit the circumstances. The liquid market for tax credits under the Low Income Housing Tax Credit program is such a market mechanism. The greatest burden to developers will vary by location, so subsidies or assistance should be tailored to a particular region.

RENTAL PROGRAMS ARE ESSENTIAL COMPLEMENTS TO HOUSING FINANCE PROGRAMS FOR HOMEOWNERS

In many parts of the world, homeownership is not a practical option for lower-income households. Even when households want to buy a home, they may not have access to financing or cannot accumulate a down payment, and so they must remain in rental housing. Renting can also be more attractive, offering flexibility and more predictability in housing costs.

Different countries have specific preferences for renting vs. owning in their housing policies. The choice depends on a number of factors, including concentration of economic centers, tax regimes, and preference for mobility. In choosing either model, the policy structure should preserve both choices through supply of units and access to financing. Even when homeownership is favored, rental options need to be supplied for those households that cannot or do not want to buy. In a model focused on ownership, declining construction rates of rental properties will push rent prices upward. This problem manifests itself in very real and deleterious ways. For instance, in Ghana, demand for rental units is so high that for some properties, tenants must pay up to two years of rent in advance to secure a lease. To complement ownership, governments can explore rental subsidies, regulatory protection, and hybrid rental/ownership schemes.

Rental subsidies can be a vital means to bridge the affordability gap for the lowest-income groups

Typically, governments offer direct rent subsidies—cash assistance paid to either the landlord or tenant—to their lowest-income households, particularly in cities with extremely high rents. These subsidies may be in addition to other subsidies. For example, in the United States, tenants may use a housing voucher to help cover rent in a property that was developed with affordable housing tax credits. In some countries, such as the Netherlands, rent subsidies are funded as entitlements, so that all applicants who qualify receive a rental allowance. In the United States, funding for vouchers is fixed every year by the federal government. When the number of qualified recipients exceeds available funding, applicants are placed on waiting lists. In some states it may take years to receive assistance; typically, applicants with emergency needs such as homelessness are given priority.

Rent subsidies can help households to bridge the affordability gap, but these direct subsidies may not provide households with any permanent housing options. Rent subsidies usually do not expire, and recipients remain qualified as long as they continue to prove that they meet income limits and other criteria. Without other changes in their underlying economic situation, low-income households are therefore dependent on continued assistance from the government. Because this funding stream is often vulnerable to political change and national budgets, direct rental assistance should be part of a larger affordable housing policy, encompassing supply-side policies, regulatory protection, and broad anti-poverty efforts.

Approaches to rent regulations require a careful balance between tenant protection and market efficiency

One of the most important considerations in efforts to maintain a healthy rental market is balancing the interests of tenants and landlords. Tenants should be protected from usury rents and have their units maintained at a reasonable level; landlords need to be able to evict tenants for non-payment or other reasonable causes and be able to generate enough revenue to recover their cost of capital. Regulatory schemes can help balance tenant rights with market flexibility. Regulations typically lay out standard dwelling-unit definitions and maintenance standards and may specify grounds for eviction.

Governments can keep housing affordable by regulating the rate at which rents can rise. Holding rents at the initial market rate provides valuable stability for households living in areas with escalating home values. Rent control schemes became popular in Europe and North America after World War II. However, when not carefully calibrated, several negative market distortions result from rent control, including deteriorating housing (low returns discourage refurbishment), deterred mobility (rent controlled units are too valuable to leave), depressed housing supply (landlords convert units away from rental housing in order to see a return), mismatched allocation (families stay in too-large homes because of low prices), and widespread abuse (falsifying names on lease agreements).[87] While most of these issues can be addressed, those first-generation schemes have been largely phased out as overly restrictive.

87 E. Jay Howenstine, "European experience with rent controls," *Monthly Labor Review*, volume 100, number 6, June 1977.

Germany has managed to maintain a sizable rental market under rent control. More than two-thirds of households in Germany rent, in part because the German tax code does not privilege homeownership but also because of the protections offered to tenants. For example, while initial rents are set at market level, price increases are capped at 20 percent over a three-year period—far more flexible than a rent control system, but still providing stability for tenants. Tenants can be evicted only for failure to pay or if the landlord is selling or moving into the property.

Hybrid rental/ownership models are emerging

Finally, there is a hybrid system under which renters become owners over time. In such a scheme, a portion of rent goes toward purchasing a share of the property, gradually building equity in the unit. Such a scheme may also be attractive to developers since tenants participating in a rent-to-own scheme confer stability and security and the program provides a mechanism to offload some of the equity risk associated with ownership.

In the United Kingdom, shared ownership schemes are used to enable low-income households to acquire a partial interest in a home rather than attempting to buy one outright. The program is aimed primarily at residents of public (council) housing, as well as active-duty military personnel and first-time home buyers. Separate programs are available to disabled people and citizens over the age of 55. The programs are administered by local property associations, which bring in outside investors. In a typical transaction, a housing association arranges for an investor to buy a 25 to 75 percent share in the property.[88] Across the United Kingdom, an estimated one million households are using shared ownership schemes for residential transactions.

Expert insight

Friedemann Roy, global product lead housing finance access, International Finance Corporation

Q: What would you tell policy makers who are thinking about improving access to housing finance with the help of subsidies?

A: Governments that are considering the introduction of a finance subsidy can benefit from the results and experiences that developed and developing countries have had. Interest rate subsidies, for example, are considered regressive and ineffective since households with larger loans tend to benefit to a greater extent from these subsides than households with smaller loans.

Substantial losses of revenue are commonly cited as a drawback for the deduction of mortgage interest payments. In the United States, for example, mortgage interest deductions amount to 2.7 percent of the federal budget (or about $103 billion).

Subsidy design should focus on efficiency (does the subsidy lead to market distortions?), stability (will the subsidies not pose a particular burden to the state budget over time?) and fairness (do subsidies lead to an improved access of low-income households to finance?). Another important point, which is often forgotten in the debate on appropriate schemes, is that subsidies are no substitute for reforms to improve the enabling environment—creating conditions conducive to housing finance. For example, a reform of the land registration system or the implementation of a credit bureau could be a more effective tool to increase the supply of affordable housing than a subsidy scheme.

88 B*eyond Korean style: Shaping a new growth formula*, McKinsey Global Institute, April 2013.

3. Creating the right delivery platform for each city

The progress toward closing the affordable housing gap that is possible through the concerted application of the approaches we describe in Chapter 2 cannot take place if cities do not have effective ways to carry out housing initiatives. Here we focus on what goes into a successful "delivery platform" for affordable housing. From the experiences of cities and governments around the world, we see that an effective delivery platform involves four steps: ensuring that programs are based on carefully defined community needs, choosing appropriate delivery models (will housing be built by consumers, the private sector, or government?), exploring all potential sources of funding, and investing in improving the performance of the people and processes that government uses to support housing, including by making sure that permitting and approvals are not an obstacle. In this chapter we offer a toolkit that cities can employ to manage housing delivery.

DESIGN PROGRAMS WITH COMMUNITY INPUT AND ENSURE THAT BENEFITS REACH INTENDED BENEFICIARIES

Affordable housing programs need to be designed to address specific local concerns and sensibilities. Therefore, they must be designed with the input and cooperation of the public, the business community, and other stakeholders in the city. Critically, planners and program administrators must be clear about who will qualify for homes that are built and rehabilitated and with public resources.

Build support through community engagement and collaboration with all stakeholders

For programs to succeed, they must have widespread support among various constituencies in the city, from citizens who will be affected directly to the real estate, construction, and finance industries. Working with these stakeholders, planners can avoid mistakes when defining what a standard housing unit is for households of different income levels or siting new housing without consideration for how residents would connect with schools and employment. Residents at all income levels will be concerned about the impact of changes such as higher density rules, and their fears will need to be addressed.

Public engagement needs to begin before the start of a project and continue through delivery and occupancy. Ashoka, a global network of social entrepreneurs, engages deeply with the community during the planning phase of projects under its Housing for All program. To get information about the needs of low-income residents in India that goes beyond what is captured in government surveys, the group trained slum dwellers to interview other residents who had been selected as a sample. This elicited insights into the design needs of different

types of households. Ashoka says that their work convinced microfinance institutions, private companies and real estate companies to invest in affordable housing projects.[89]

Cities should think broadly about who constitutes the external stakeholders in housing policy. Stakeholders may include international aid organizations and technical implementation partners. Stakeholder collaboration can be very broad, including formal public-private partnerships or very tactical—tapping local experts for advice, for example. When selecting partners, it is important to start by identifying the skills and resources that are lacking within the city administration and the outside parties that can fill those gaps. The next step is building relationships with key players and systematically removing barriers to their participation. By doing so, governments and agencies can make the most of external stakeholder capabilities and resources and build on the coalition that is established through public engagement.

The Nigeria Mortgage Refinance Company, whose mission is to build up the nation's home financing capacity, is an example of a partnership with external stakeholders. The company is jointly run by government entities (the Ministry of Finance and Ministry of Lands, Housing and Urban Development, and various states) and the World Bank, which seeded the company with $300 million and has attracted investment from commercial banks, primary mortgage banks, insurance companies, private equity investors, and international financial institutions.

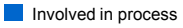
Cities should also think carefully about what partners can contribute in addition to money. The East Baltimore Development, a partnership between developer Forest City, Johns Hopkins University, the city of Baltimore, and the state of Maryland, was established to develop affordable housing, a commercial science and technology park, laboratory space, and new community and university education centers on an 88-acre site that the city assembled through eminent domain. The focus of the development and the jobs that were created reflect the characteristics of the partners. The non-profit partnership has operated for more than ten years, adding new components to the development and increasing the housing supply.

A formal governance model that lays out how stakeholders will be engaged can help avoid roadblocks (Exhibit 65). If new construction is needed, nearby residents and the target population for affordable housing should be engaged early in the process to provide input in the planning and design phases.

89 Scott Anderson, and Rochelle Beck, *The big idea: Global spread of affordable housing*, NextBillion and Ashoka Full Economic Citizenship, 2012.

Exhibit 65

Effective governance models incorporate a broad base of stakeholders and engage consumers at multiple points



Stakeholders	Land acquisition	Land development	Property development	Project financing	Design and construction	Sales and marketing	Ops and maintenance	Consumer financing
Housing administration	■	■	■	■	■	■	■	■
Government institutions	■	■	■	■	■	■	■	■
Local authorities	■	■	■		■		■	■
Funding institution				■				■
Private developers	■	■	■	■	■	■	■	
Home builders			■	■	■	■		
Cooperatives	■	■	■	■	■	■	■	■
Construction suppliers					■			
Consumers	■	■	■		■	■	■	■

SOURCE: McKinsey Global Institute analysis

Establish rigorous qualification and allocation systems to direct supply toward intended beneficiaries

The process of allocating the benefits of housing programs—whether the benefit is access to new affordable housing units in a new private development or qualifying candidates for rental assistance or subsidized home financing—must be equitable and transparent. The public will want to see that criteria are fair and that a rigorous screening mechanism ensures that benefits flow only to the intended households.

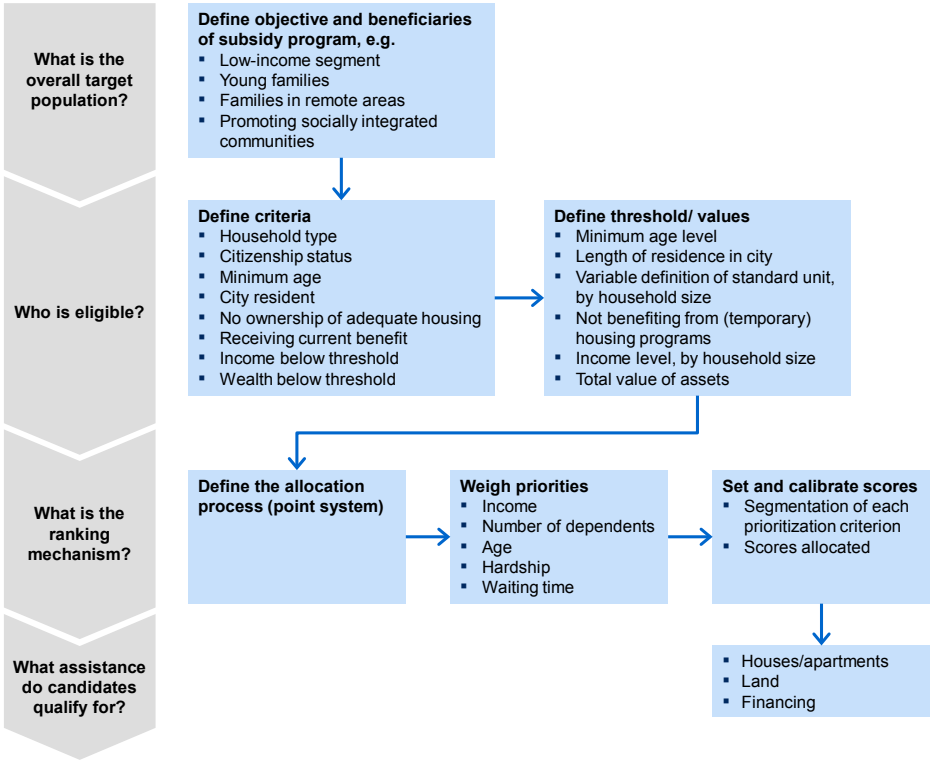
A reliable method for determining eligibility is essential. Decent, affordable places to live are not only highly sought-after by those unable to afford housing, but they also have significant economic value, which inspires vigorous efforts to obtain them fraudulently. There are many methods of determining eligibility and establishing priorities among different types of beneficiaries (providing preferences for the elderly or the disabled, for example). In our research, we have found that there are four major steps in effective allocation systems (Exhibit 66).

The first step in allocating affordable housing is determining the target segment and establishing who will be eligible. The target population could be specific income groups or socially disadvantaged or vulnerable segments or specific high-priority segments such as war veterans. The goal could also be to create socially integrated communities that have a specific mix of people that will then influence the eligibility. With the overall goal set, the developer or housing authority then can specify the criteria that define the desired population in terms of household type, age, income, social parameters, and so on. Some cities have very specific requirements. In Shanghai, a man must be at least 30 and a woman must be 28 to apply for a low-income unit. They must have lived for three years in the city and two years in the district where they are applying, and they must not exceed the income limits. In the United Kingdom, local housing authorities set eligibility criteria and preferences according to local needs such as homelessness or overcrowding.

Exhibit 66

Four steps are commonly used to qualify beneficiaries

ILLUSTRATIVE



SOURCE: McKinsey Global Institute analysis

Housing authorities use a number of tools to verify that applicants meet their criteria. In South Africa, for example, applicants must have a verified national identification number, and screeners check the national housing subsidy database to ensure that applicants are first-time beneficiaries, a requirement for new housing. The agency also checks the registry of deeds to make sure that the applicant does not own an existing property. Finally, applicants must provide data and testimony to prove their eligibility. In Shanghai, a district housing guarantee agency is responsible for checking that all applicant statements and data are accurate. In Turkey, TOKİ does not validate eligibility claims but imposes harsh penalties for misrepresentation if a false statement is discovered. In the United Kingdom, a "high-touch" approach is used, in which local housing councils not only verify the information submitted by applicants in online applications but also confirm current housing conditions, based on direct knowledge of the community.

Once eligibility has been established, there are many ways to allocate available housing to qualified residents (Exhibit 67). Lotteries and first-come, first-served systems are simple and impartial. In needs-based systems, the housing agency evaluates the needs of all applicants to allocate available units. There are also choice-based models, in which the applicants indicate their preferences and the housing agency or approved landlords who accept low-income tenants attempt to offer housing to match the request.

Turkey's TOKİ program uses a lottery to allocate rent-to-buy units (after paying rent for several years, renters become owners). The agency simply advertises availability, price, and terms of payment when new units are on offer. Applicants

are required to be present at the drawing. This method requires little overhead by TOKİ and helps enforce the impartiality of the allocation process in a place where demand far outstrips supply.

South Africa deals with the allocation challenge by giving local agencies a choice of running a lottery, which requires less staff capability, or using a first-come, first-served system that assigns units to applicants based on when they apply. The housing agency starts by inviting residents of the target community to apply on a certain date and assists applicants with filing. The list is adjusted according to preferences for the elderly, disabled, and other vulnerable segments.

Shanghai uses a hybrid system that combines a waiting list with a lottery. The waiting list is created by randomly selecting applicants from batches of applications filed during a certain period. The agency inspects the list through random checks to disqualify any household that fails to meet requirements (despite having passed preliminary agency checks). After being placed on a waiting list, applicants sign up for periodic lotteries, and if an appropriate unit is not available, applicants move up the list for the next round. The city of Birmingham, England, has a well-developed system to allocate affordable housing based on needs. Each criterion (such as overcrowding, military service, homelessness) is assigned a number of points. Homelessness and eviction due to demolition are given the highest weights. Applicant scores are tallied and placed in four bands, with the applicants in the top band designated for immediate assignment to a unit that matches their requirements.

Exhibit 67

Five main models are used to allocate housing around the world

	Allocation approach				
	Lottery	**First come, first served**	**Needs-based**	**Agency-driven, choice-based**	**Market-driven, choice-based**
	Households register for social housing; applicants are then randomly selected for allocation	Applicants are assigned housing according to the order in which they signed up	Agency evaluates the household and prioritizes allocation according to greatest need	Households select their preferred choices; units are allocated in order of need or position on waiting list	Households submit applications directly to agency-approved landlords who make the allocation decisions
China	●	●	●		
France			●		
Germany					●
Mexico		●			
Singapore	●	●			
South Africa	●	●			
Turkey	●				
United Kingdom				●	
United States		●	●		

SOURCE: McKinsey Global Institute analysis

Finally, there are choice-based methods. Some UK housing councils have adopted a choice-based system, in which the council assigns units according to choices indicated by qualified applicants, who are given priority based on needs scores. An alternative market-based choice system is also being used in the United Kingdom. Applicants indicate their choices from listings of available affordable housing, and the government assigns units based on requests and level of need.

Where affordable housing is offered on the market, governments can accelerate the sales process by building a directory of interested applicants, who should be encouraged to make credit applications to banks in advance. In the absence of a well-defined target list, developers must employ various forms of promotion and marketing, which can add 5 to 7 percent to costs. By providing a list of qualified applicants and speeding up sales, government can help improve the rate of return on the project.

CHOOSE A COMBINATION OF DELIVERY MODELS THAT FITS THE LOCAL CONTEXT

There are several possible models for delivering affordable housing (defining how housing will be constructed and operated), ranging from small-scale private home builders to large public-housing authorities. Selecting the best model for a given context depends on a variety of factors, including the state of the housing industry, availability of developable land, and nature and tenure of the housing market. Finding appropriate delivery models for the circumstances of the nation and community is a key enabler for creating a supply of affordable housing. In all cases, the government or city administrations will need to play a central role to support the housing sector along the value chain, from land acquisition to operations and maintenance. While the various delivery systems typically exist concurrently, policy decisions can influence the balance between these models. Around the world, four major models for affordable housing delivery have emerged, reflecting different ways to manage the home-building process:

- **Consumer-led model.** In this model, individual households lead the process in the construction or resale or refurbishment of homes, which are constructed by private builders. The government can play a role by strengthening the construction industry to help ensure that consumers get good-quality homes at reasonable prices and that the sale of homes is regulated. Because the home-building industry is typically very fragmented—with players ranging from large developers, to small-scale construction companies, to independent contractors—consumers wishing to build their own home are left to navigate a complex process. This model works best when a robust private market exists, but it suffers from complex processes and limited information that disadvantages consumers. Governments can help make the consumer-led model function efficiently by providing consumers with the knowledge and advice to manage the processes of building or renovating properties, navigating the sales market, offering benchmarks and technical assistance, and providing programs to help refurbish existing units.

- **Incented private development.** In this model, private developers receive financial and non-financial incentives to build affordable housing. The homes are sold directly to consumers, purchased by the government for allocation to citizens, or operated as rental properties. The government determines what incentives are appropriate and what land qualifies for such incentives, and

it ensures that developers who receive incentives deliver the agreed-upon affordable housing units on time and meet quality standards. In doing so, government can steer an already-developed private market toward areas of greatest public benefit.

- **Public-private partnerships (PPPs).** This model generally involves more direct government intervention than incented private development. The city or housing authority becomes an active partner in development, rather than functioning as a passive, regulatory actor. In a PPP, the private developers often build housing units on public land, with finished units sold directly by the private partner or allocated by government to buyers or tenants. The primary role of government is to de-risk the development and create the right contractual and legal framework for private players to bid on projects and join the partnership. The tools of incented private development may also be used in a PPP.

- **Public delivery model.** This remains an important source of affordable housing around the world. Governments often engage private contractors to build the project on public land, while still acting as the primary developer and retaining ownership. The housing agency sells or rents completed units to citizens, typically maintaining a strong management role. By exerting more control over the process, governments open the possibility of creating a large-scale housing industry without being dependent on the timing or financial capacity of the private market.

Consumer-led model: Interventions are needed in a fragmented system

In many countries, housing development remains piecemeal and public housing does not address the needs of the low- to middle-income market. Furthermore, land-use policies are governed by multiple layers of regulation that have built up over decades. Small-scale builders of individual homes (rather than large-scale home developers) are dominant suppliers of housing. Large developers may create pockets of single-family homes, but overall the industry remains fragmented and disorganized.

In the consumer-led model, the central challenge is that consumers lack the knowledge and capability to optimize the process of building a home, while many developers operate at subscale and lack technical capabilities to optimize building quality and costs. This applies equally to new units that are created and the resale of existing units. Government can improve the functioning of this system and protect consumers by reducing the flow of asymmetrical information (by providing performance data about builders, for example), reducing consumer search and transaction costs, and providing incentives for builders to improve their performance.

Benchmarks and technical assistance

In a consumer-led model, the typical buyer enters the process with a huge disadvantage in terms of knowledge and expertise. To improve the consumer's chances of getting a well-built home at a reasonable price and within a reasonable time, the government housing organization can provide benchmarks and other relevant information. Benchmarks protect consumers by showing average construction costs and minimum specification standards for housing with a given set of features. Technical assistance provides guidance (for example,

published benchmarks) to help consumers ensure that builders are conforming to construction standards and contract terms and are meeting delivery milestones (Exhibit 68).

Exhibit 68
Examples of government-provided construction benchmarks

	Country		
	India	**Singapore**	**United Kingdom**
Issuing body	Construction Industry Development Council[1]	Building and Construction Authority (Singapore government)	Department for Business, Innovation, and Skills
Source	Planning commission, government, and construction industry	Davis Langdon (private benchmarking firm)	Government statistics
Update frequency	Monthly	Biannually	Quarterly
Detail	▪ Covers 8–9 sectors (not specific to homes) ▪ No detailed benchmarks	▪ High-level construction costs for various cities in China and Southeast Asia ▪ Residential, commercial, hospitality	▪ Tender price index of public-sector building, non-housing, social housing, building, and road construction ▪ Materials, labor, and maintenance costs

1 The Construction Industry Development Council is a joint venture with the Planning Commission of India.
SOURCE: India government; Singapore government; UK government; McKinsey Global Institute analysis

To provide a higher level of assistance, government can create registries of certified home builders. Certification can be a mechanism to monitor builder performance on an ongoing basis, enforce a uniform contracting approach, and provide some level of legal protection to consumers. Under a registry and certification system, authorities can promulgate standard contract forms that establish a common set of terms and conditions, which protect the interests of all parties. Mexico has created a dedicated certification body to compile and manage lists of qualified home builders who are extensively used in affordable housing programs. The certification body is funded by two public finance agencies, and borrowers must use a registered builder to receive their funds, ensuring that publicly funded loans are used wisely.

Technical assistance programs offer guidance to newcomers to the housing market, whether they are first-time home buyers or renters. These programs provide financial education and assist consumers in understanding the options available to them. Typical services include advice on financing options, trade-offs in renting vs. ownership, information on the housing market, and an overview of the process. These services are delivered in-person or on the Internet, and many are targeted to low-income households. The housing entity usually contracts with third parties to provide such services. Brazil, Mexico, and the United States have used variations of technical assistance programs (Exhibit 69). Mexico provides technical assistance through its public mortgage-finance institutions.

In markets where households are more likely to purchase a house than construct one, government can also provide assistance navigating the process. In the United States, the Department of Housing and Urban Development offers free or low-cost financial counseling services for those considering a purchase. These services help households work through what they can reasonably afford, how to access lending, opportunities for additional financial assistance, and risk assessment and recourse options should problems arise. Many non-profits offer similar assistance programs.

Exhibit 69
Examples of construction technical assistance programs

	Country		
	Brazil	**Mexico**	**United States**
Providing body	*Minha Casa Minha Vida*	Unique housing registry/ INFONAVIT	State of New York—storm recovery scheme
Level of involvement	Moderate	Moderate	High
Detail	▪ Consumers receiving financing to build their own homes must enroll ▪ Prepaid card that can be redeemed only for construction expenses prevents misuse of funds	▪ End-user must submit financial and physical program to funding body (INFONAVIT or other) for approval ▪ Technical assistance managed through financing companies—not registry	▪ Case managers were trained to walk residents through all steps of the program, from registration and document collection and verification, to selection of a contractor, to finishing the project

SOURCE: *Minha Casa Minha Vida*; UHF; INFONAVIT; state of New York; McKinsey Global Institute analysis

Incented private development: Balancing carrots and sticks

Private developers can be efficient producers of affordable housing if the market conditions are right, and governments can use a wide range of tools to further direct this market. To do so effectively, there must be a highly competitive developer market and the correct incentives must be offered to make it worthwhile for builders to take on affordable housing projects. These include financial and non-financial incentives that tilt the economics in favor of affordable housing (Exhibit 70). By offering developers a greater return than they would have otherwise been able to achieve on a certain parcel, incentives can create positive outcomes for both the public interest and developers.

Exhibit 70
Governments provide a range of financial and non-financial incentives to build affordable housing

Incentives	Benefit to developers	Incentive	Detail
Financial	Decreasing cost of financing	Investment loan scheme	Providing financing at lower interest rates for investments by developers
		Land development funds	Providing a pool of capital for developing land into housing
	Improving profitability of housing delivery	Rent subsidies	Providing subsidy to cover difference between market rent and rent for affordable housing unit
		Infrastructure subsidy	Providing financial support to develop internal infrastructure
		Import tax breaks	Providing tax breaks on imported construction material
		Land donation/lease	Leasing land at low cost or for free for long periods
Non-financial	Decreasing risk	Government buyback	Guaranteeing buyback of units to decrease demand risk
		Facilitated off-take	Enabling developers to market to end-users and potentially providing mobilization payment
		Fast track permits	Simplifying and expediting processes for getting master plan approvals and building permits
		Cross-subsidization through mixed development	Allowing developers to undertake commercial development on residential land to cross-subsidize affordable housing
		Parcelization of raw land	Allowing developers to parcelize large plots of land and issue separate title deeds without developing entire land
	Increasing land availability	Land set aside for public use	Limiting area set aside for public use
		Increased density	Allowing increased density in areas reserved for affordable housing projects
		Transferable development rights	Enabling developers to transfer their density bonuses obtained through affordable housing development across land parcels or to trade them with other developers
	Improving infrastructure	Infrastructure connectivity	Providing infrastructure connectivity (utilities, roads, public transit) to outskirts of the city
		Social infrastructure	Providing support for building social infrastructure (schools, clinics, etc.)

SOURCE: McKinsey Global Institute analysis

Examples of financial incentives are tax breaks (including breaks on duties for imported materials), low-rate financing, and direct subsidies for construction and infrastructure to compensate the developer for below-market returns. Non-financial incentives include fast-track permitting to shorten delivery time and density bonuses that allow the developer to build more units than zoning would normally allow; both incentives improve the rate of return for developers. Many of these incentives have been discussed throughout the report, but their effective implementation requires precisely crafted programs.

Designing incentives

When aligned with specific targets for desired types and volumes of housing and carefully calibrated, incentives can advance local public-housing aspirations significantly. Well-calibrated incentives are sufficient to generate the desired investment, but should not be so generous that they offer more compensation than is needed and create unnecessary public expense. They should be flexible enough to accommodate changing market conditions that affect the economics of affordable housing. Finally, incentives should be provided in a transparent manner, meeting public scrutiny and allowing for coordinated accountability, sufficient quality standards, and enforcement.

- **Financial incentives.** Direct financial incentives can be used to improve cash flows associated with affordable housing development. Government can agree to pay developers a direct subsidy that represents the difference between the rents for market-rate units and the rent set for low-income tenants. Where land for development is hard to come by, government can donate public land to private developers that agree to build affordable units. Some countries also set aside funds to compensate developers for the cost of development on land with unusual challenges, such as soil contamination or rocky terrain. Infrastructure subsidies and grants that reduce the net cost of construction are also ways to incent developers.

- **Non-financial incentives.** Some non-financial incentives are aimed at reducing developer risk in order to encourage development that would not otherwise occur. For example, fast-track permitting and speedy approvals by all relevant agencies can help projects move ahead sooner, reducing developer costs and risk. Also, government can reduce marketing risk by agreeing to buy back completed units, or it can improve the economics by allowing mixed development. Density bonus incentives or relaxation of open-space requirements can be incentives to build affordable housing. They give the owner the right to build larger projects with more market-rate buildings, which indirectly funds the cost of providing required affordable units. Transferrable development rights allow builders to erect extra market-rate units provided by the density bonus at another location where such development would have even greater value.

Identifying parcels to be developed with incentives

In order to target incentives effectively, housing agencies need to clearly define which properties are eligible. These definitions should take into account the urban plan, zoning restrictions, and access to infrastructure. Incentives should take into account the type and location of parcels to be developed; for example, ensuring a minimum parcel size so that a sufficient scale of development will take place to improve access to affordable housing.

There are two ways to qualify parcels for development: defining a minimum threshold and land scoring. Minimum thresholds delineate the specific, standardized criteria a development must meet in order to receive an incentive. The United Kingdom uses a land scoring system to rate parcels based on a range of criteria. Parcels still have to clear the minimum eligibility criteria but are also evaluated on average prices of land, amount of idle land in the particular zone, and potential for housing development. Using different scores or tiers for evaluating potential parcels for incentives allows government to prioritize the requests and set differentiated levels of benefit. For example, a more deeply targeted affordable housing effort may be needed to justify an incentive on a lower priority parcel, while in key areas, an investment targeted at moderate-income households may generate sufficient return. It can, however, be more difficult to administer since surveys of all possible sites might be needed, possibly delaying any incentive awards.

Managing incentive programs

The incentive schemes that are chosen must be vigorously monitored. The housing agency needs to provide guidelines to ensure minimum quality of development and safeguard end-user interests. Incentive payments should be aligned with how developers complete specific requirements, and payments should be made on a milestone basis. There should be checks and balances during implementation to ensure that penalties for deviations from agreements are enforced. The agency will need to monitor every step in construction to detect any variance from development guidelines. To enforce compliance, all requirements specified by the agency (as well as all applicable building-code requirements) must be met before completion certificates are approved. Completion certificates can also be used as an enforcement mechanism to ensure that incentives such as density bonuses have not been misused. To ensure on-time delivery of housing projects, housing authorities can link loan guarantees or other financing commitments to specific milestones. Finally, the agency can require the developer to complete affordable units before proceeding with the market-rate units.

Public-private partnerships: Managing for value

Public-private partnerships are a powerful method for developing affordable housing by leveraging the best of both the public and private sectors, wherein the government enlists a private-sector partner to deliver housing under agreed-upon conditions. PPPs are often used to develop affordable housing when government can contribute a critical asset such as land for development. PPPs are particularly useful when the market is not likely to respond to common incentives for private development; for example, when markets are so weak that any additional burden on private development would discourage building altogether. To make building affordable units profitable for the private partner, government may de-risk specific steps in the housing value chain. At the same time, a greater share of risk should also equal a greater share of return. Public-private partnerships require proper allocation of risks, an appropriate contractual framework, a systematic developer-selection model, safeguards for the public interest, and provisions for ongoing operations and management.

Ensure risks are allocated effectively

Risks should be allocated in line with both rewards and capabilities (Exhibit 71). Given the risks in obtaining titles and permits in many developing economies, land acquisition and land development risks for PPPs are often best borne by the government. Property development, design, and construction risks are typically borne by the private-sector partner, which is best positioned to manage these risks and should have the skills for effective execution.

Demand risks (the chance that units will go unsold or unrented) can be borne by either the government or the private sector—the decision will depend on local circumstances. There are models where the public sector eliminates demand risk by agreeing to buy affordable units or guaranteeing demand by providing a roster of pre-qualified tenants or purchasers (known as off-take agreements). Facilitated off-take is a variation that attempts to align government and developer incentives: the city provides a pool of beneficiaries who qualify for financing, but it is up to the developer to market the product to the beneficiaries.

Exhibit 71

There is a natural allocation of risks among participants in the value chain

Real estate and development value chain

Role	Activities	Risks	Natural owner	Rationale
Land developer	Land acquisition	▪ Inflation risk ▪ Regulatory risk	▪ Government housing agency	Privileged access to valuable land banks at low cost
	Land development	▪ Regulatory risk (zoning) ▪ Infrastructure development	▪ Government housing agency	Required scale/funds to develop and deliver infrastructure
Property developer	Property development	▪ Product development risk	▪ Developer	Experience to minimize risk from developing faulty or unappealing products
	Project financing	▪ Liquidity risk	▪ Specialized funds ▪ Multilateral institutions	Pools of capital with a required investment risk/return profile matching revenue of infrastructure projects
Builder	Design and construction	▪ Engineering risk ▪ Execution risk	▪ Contractor	Skill set, experience, and scale to manage and minimize engineering and construction risks
Realtor	Sales	▪ Engineering risk ▪ Execution risk	▪ Developer	Skill, experience, and processes to manage sales effectively
Facility manager	Managing assets/ operations	▪ Operational risk	▪ Facility manager	Scale and operational processes to manage and mitigate risk
Real estate financier	Financing	▪ Liquidity risk ▪ Default risk	▪ Bank	Banks have proprietary risk assessment tools to accurately price and quantify default risk and manage liquidity risk

SOURCE: McKinsey Global Institute analysis

Screen PPP partners

The screening and application processes for potential development partners should be expeditious to avoid delays that would discourage developers from applying. Exhibit 72 shows the qualifications that might appear on a typical developer criteria checklist.

Exhibit 72
Sample developer qualification criteria

Criteria		Details
Organi-zation	Capabilities	▪ Maturity of organization and relevant experience ▪ Organizational structure ▪ Expertise across critical functions (design, engineering, project management, procurement, sales and marketing) ▪ Adequate capacity/resources to be committed to project
	Strength and quality of partnerships	▪ Legal status of bidder ▪ Formal agreement between partners, with clear allocation of risks and responsibilities ▪ Status of any ongoing or expected litigation against bid participants ▪ Quality of other developer's other partners – Suppliers – Contractors and subcontractors – Engineering, design, and/or project management firms ▪ Term relationships with key suppliers relevant to proposed project
Financial health		▪ Three years of audited financials, including data on net asset value, debt-to-equity ratio, and liquidity ▪ Evidence of good financial standing (bank lines of credit)
Real estate development track record		▪ Experience in residential real estate development in the region ▪ Experience in developing residential real estate projects on a comparable scale ▪ Evidence (customer testimonials) of ability to maintain timelines/budgets and to market and sell units
Approach to housing development		▪ Understanding of requirements and key success factors for housing (design, cost, maintenance) and the needs of local market (specification, features) ▪ Explanation of approach used to develop and market housing

SOURCE: McKinsey Global Institute analysis

Develop clear contractual structures

Public-private partnerships require the right operating model to facilitate interactions among the different parties. This may require housing agencies to organize special-purpose vehicles to accommodate the structure of the partnership or pass legislation to facilitate partnerships with developers. Such a framework serves as a precursor to developing an operating model in conjunction with the other parties. Contracts among all key parties need to be designed up-front with clear terms and conditions.

In the operating model example in Exhibit 73, the government housing agency sets up a "delivery unit" that is responsible for administration, management, and monitoring of the public-private partnership. The unit also helps with the requests for proposals for specific sites, developer selection, and implementation of the mandate with selected developers.

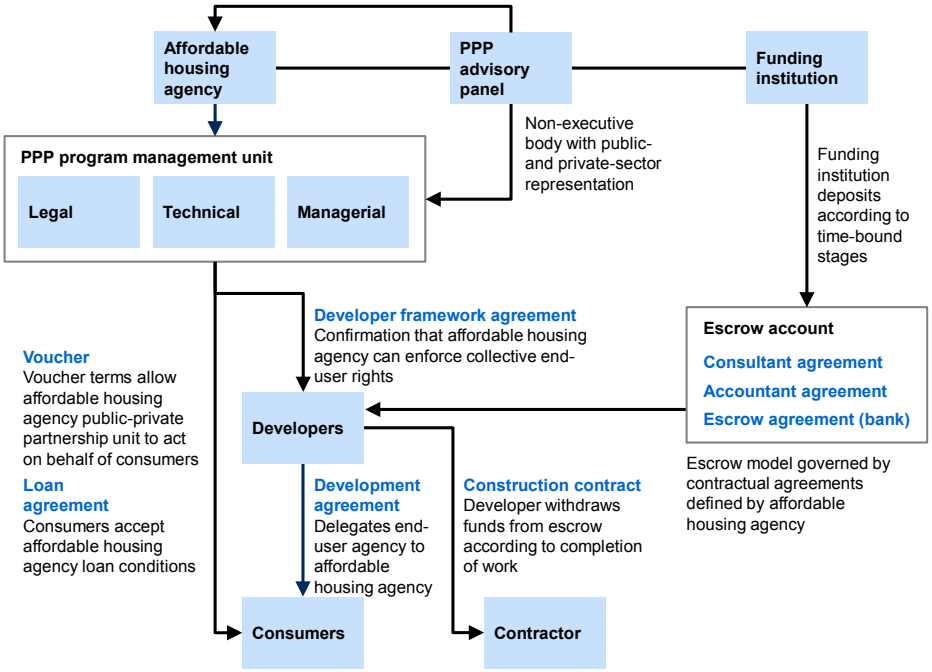
Before a partnership is proposed, developers should be thoroughly screened and required to provide their qualifications through a systematic process. Payment is then made to the developer through an escrow account to further protect all parties. The escrow account gives the developer the certainty of cash flows and allows borrowing against these flows, providing a source of project finance.

The developers market directly to buyers and complete sales according to government-defined contracts. Buyers finance purchases through a financing entity, with a loan that may be guaranteed by the government to encourage lending to low-income citizens.

Exhibit 73

Legal and contractual basis for affordable housing public-private partnerships (PPP)

ILLUSTRATIVE


Affordable housing agency
PPP advisory panel
Funding institution
Non-executive body with public- and private-sector representation
PPP program management unit
Legal
Technical
Managerial
Funding institution deposits according to time-bound stages
Developer framework agreement
Confirmation that affordable housing agency can enforce collective end-user rights
Escrow account
Consultant agreement
Accountant agreement
Escrow agreement (bank)
Voucher
Voucher terms allow affordable housing agency public-private partnership unit to act on behalf of consumers
Loan agreement
Consumers accept affordable housing agency loan conditions
Developers
Development agreement
Delegates end-user agency to affordable housing agency
Construction contract
Developer withdraws funds from escrow according to completion of work
Escrow model governed by contractual agreements defined by affordable housing agency
Consumers
Contractor

SOURCE: Sample affordable housing public-private partnership projects; McKinsey Global Institute analysis

Protect public interests in short and long term

To ensure that the government is getting the value it expects, the agency can specify minimum technical standards and minimum conditions for execution. These include execution guarantees (advance payment bonds from developers to government and performance bonds), payment conditioned on validated progress (using escrow accounts), and delay penalties. To enforce timely delivery of projects, the Indian state of Rajasthan offers a 0.5 bonus on top of a 4.0 floor-area ratio allowance for developers whose projects are completed within the specified time frame (see Box 12, “Tackling Rajasthan’s affordable housing challenge”). Protecting the public interest also involves ensuring that developments will be maintained and operated to a high standard after construction. Agencies sometimes require developers to include operations and management services for a specified period as part of their bids; after that, the homeowner association or the housing agency takes on the responsibility.

Use full potential scale and value of PPPs

Public-private partnerships often make it possible for projects to go beyond the scope of housing units to include infrastructure and social support systems. A growing number of countries are developing delivery units that provide the necessary coordination across agencies to make investments on a larger scale (Exhibit 74). Partnerships may be with a single major private-sector actor or a broad consortium. Bahrain has a partnership with a single developer to build a $450 million development in which the government is contributing the land and infrastructure support. Large coalitions can bring in more capabilities and are more complex, requiring clear ownership of various processes and sophisticated

risk allocation, but these arrangements also offer broader opportunities. Having many partners can also increase competition, which can ultimately lead to better products for beneficiaries.

Exhibit 74

Public-private partnerships address infrastructure, housing, and other social challenges

Function
- Executive
- Non-executive

Country	Name	Location of unit	Government entities	Private sector
Brazil	Unidade Public-Private Partnership	Ministry of Planning	●	
Malaysia	Public-Private Partnership Unit (UKAS)	Prime Ministry	●	○[1]
Philippines	Public-Private Partnership Center	National Economic and Development Authority	●	○[2]
South Africa	Public-Private Partnership Unit	Treasury	●	○[3]
South Korea	Public and Private Investment Management Center (PIMAC)	Korean Development Institute (independent)[4]	○	●
United Kingdom	Infrastructure UK (IUK)	Treasury	●	○

1 Corporate, technical, and legal advisers to public-private partnership organization.
2 The public-private partnership center has a project development and monitoring facility.
3 Established with five members from the public and private sectors.
4 An affiliated body of Korean Development Institute, established as the Investment Center of Korea, Korea Research Institute for Human Settlement

SOURCE: World Bank; Public and Private Investment Management Center; Department of National Treasury, Republic of South Africa; McKinsey Global Institute analysis

Box 12. Tackling Rajasthan's affordable housing challenge

Rajasthan is India's largest state, and 86 percent of its 69 million citizens fall into the lowest-income groups, with household incomes of less than $2,800. In 2009, the government launched an aggressive housing policy to address an estimated shortage of 1.2 million affordable housing units, which might reach more than 1.7 million in 2021 if no action is taken.[1] The state issued an integrated affordable housing policy in 2009 that covers slum rehabilitation policies, building regulations, and master plans for all towns. It created an urban development fund for municipalities and authorized transferrable development rights.

Today, Rajasthan uses several delivery models to create affordable housing: mandatory provision of affordable units (for projects developed by the state), three programs for private developers (for using private land, government-owned land, and land acquired for affordable housing by municipalities), and public-private partnerships for slum redevelopment. Developers building on private land are required to set aside 40 percent of units for affordable housing for low-income groups and 10 percent for middle-income households. In return, the state agrees to buy the affordable units and grants a density bonus up to twice the normal density, transferrable development rights, the option to dedicate up to 10 percent of the space to commercial use, forgiveness of various fees, and fast-track permit approval. Similar incentives are offered for projects on government-owned or government-acquired land. Since its launch, about 70,000 units have been built or are in development: 30,000 units under mandatory provision, 35,000 units under incented private development on private land, and 5,000 units on government land.[2]

1 Government of Rajasthan, *Affordable housing policy 2009*, Department of Urban Development, Housing and Local Self Government, December 2009.

2 Gurdial Singh Sandhu, *Initiatives on affordable housing*, Government of Rajasthan, July 2013.

Public delivery: an important source of affordable housing

In many countries, the public sector continues to be an important provider of new affordable housing. Building social housing for the lowest-income segments will nearly always require public funding (for an example of effective public-sector housing delivery, see Chapter 4, which describes the system used in Singapore). Public-sector delivery works best when public land is available for housing and the entity responsible for housing has the talent and capacity to duplicate the capabilities of a competent private real estate developer. Some of the critical capabilities are the following:

- **Planning on a large scale.** One advantage that public authorities have is the potential to realize scale efficiencies. Public agencies can pool demand for land and materials needed. They can build on a scale where they can get the greatest benefits of value engineering and industrial construction methods—using modular, standardized design and pre-cast parts, for example. Public agencies can also help manage the labor pool and support vocational training and skill development in the construction industry to raise productivity. However, these advantages must be seized through careful planning.

- **Delivering on budget.** Design-to-value is a critical requirement for public-housing construction. Standardization of designs and building can then set the stage for efficient procurement and sourcing in large volumes and the introduction of effective cost-control measures.

- **Delivering quality.** Managing engineering and procurement construction contractors can be a critical element of public-sector–led delivery. This requires setting up mechanisms for qualifying and licensing contractors, quality control, and continuous improvement measures through quality incentive schemes.

- **Efficient operations and management.** Effective operations and management can be carried out by the entity responsible for building social housing. Alternately, third-party vendors can be engaged for operations and maintenance. In the United Kingdom and the United States, new models are being adopted that involve resident leaders in the operation of public housing.

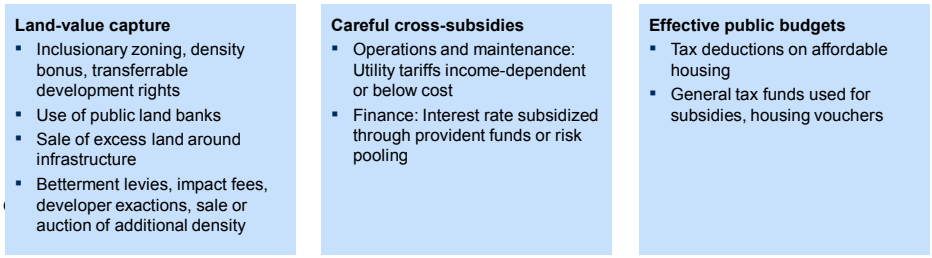
CREATE MECHANISMS TO LEVERAGE ALL SOURCES OF FUNDING

In the first part of this report, we estimated that the global housing affordability gap can be as much as $650 billon and can reach up to 10 percent of a city's GDP in major metropolitan areas. Securing the funding to bridge such gaps is an enormous and complex undertaking. Countries and cities typically rely on three broad approaches to fund affordable housing: capturing part of the increase in land and property values—from public investments in infrastructure or from changes in land use (allowing higher density, for example); through cross subsidies; and by using the public budget, including via tax breaks (Exhibit 75). Effective programs to deliver affordable housing take full advantage of all these opportunities.

Exhibit 75

Cities typically fund housing with land-value capture, cross-subsidies, and judicious reliance on public budgets

Common funding mechanisms


Land-value capture
Inclusionary zoning, density bonus, transferrable development rights
Use of public land banks
Sale of excess land around infrastructure
Betterment levies, impact fees, developer exactions, sale or auction of additional density
Careful cross-subsidies
Operations and maintenance: Utility tariffs income-dependent or below cost
Finance: Interest rate subsidized through provident funds or risk pooling
Effective public budgets
Tax deductions on affordable housing
General tax funds used for subsidies, housing vouchers

SOURCE: McKinsey Global Institute analysis

Capture increases in land value

Land-value capture exploits the rise in land values that occurs when new public infrastructure, such as roads, rail lines, new transit stations, schools, and hospitals are built. Cities can raise money directly by selling or auctioning land around new infrastructure development, as Hong Kong and Mumbai have done. The city of Dallas, Texas, generated funds for affordable housing development around new transit lines through tax increment financing. The city has issued a bond that will be paid by the incremental tax revenue from property value gains along the Lancaster Corridor light-rail line. Of the $185 million raised, 20 percent is dedicated to affordable housing development and the rest will be used to pay for new infrastructure and other improvements.[90]

Value also rises in a neighborhood when owners are allowed to build higher-density housing, as we describe in Chapter 2. For cities to successfully exploit these opportunities requires a proper legal and regulatory foundation, as well as the skills to accurately gauge the rise in value and apportion it in a transparent way between land owners, developers, and the public (including for funding affordable housing).

Nations have adopted many different approaches to tap rising land value for public uses. In Spain, developers are required by law to provide land for public amenities such as parks and give between 5 and 15 percent of profits to the municipality, as well as setting aside 30 percent of floor-area for affordable units. In Munich, Germany, which also requires that 30 percent of new housing be allocated to low-income households, the city stipulates that two-thirds of development gains be applied to public uses such as infrastructure development. Singapore expropriates land at pre-development value, ensuring that the public sector captures development gains. In the United States, the city of Boston mandates all developments above a certain size pay linkage fees (a set amount per square foot developed) for affordable housing and employment programs. The TOKİ model in Turkey primarily uses a revenue-sharing formula for luxury developments in order to fund and cross-subsidize affordable housing units (see Box 13, “How Turkey’s TOKİ delivers housing”).

90 *Dallas TOD experience and TOD TIF district: Providing unique public financial incentives for transit-oriented development in underserved areas*, City of Dallas Office of Economic Development, July 16, 2010.

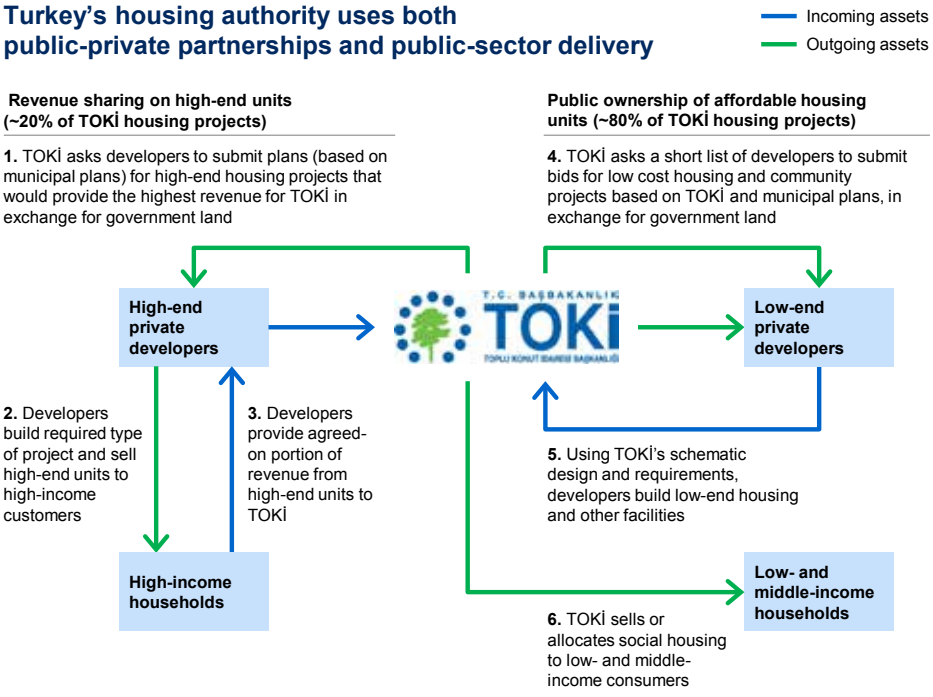
Box 13. How Turkey's TOKİ delivers housing

Turkey's Mass Housing Administration (TOKİ) builds luxury and affordable housing and operates on both the supply side and the demand side of the housing market—acting as builder and as a source of finance for construction and home purchases (Exhibit 76). It also has two delivery models, using public-private partnerships in luxury projects and public funding for affordable housing. The luxury projects cross-subsidize affordable housing. Developers are given relative freedom in design and planning and are responsible for engineering, construction, marketing, and sales. After developers sell units, any revenue exceeding initial estimates is shared between TOKİ and the developer. If revenue is less than estimated, the developer still is obliged to give the agreed-upon minimum revenue share to TOKİ. Between 2003, when the government made housing a top priority, and 2010, this system delivered more than 500,000 homes, upwards of 80 percent of which are affordable units.

TOKİ was established in 1984 as a mass housing fund, but built just 43,000 units prior to 2001. In 2003, the government started a more aggressive housing push. TOKİ began reporting directly to the prime minister and was given wide-ranging power over urban development, with a mandate to protect historical sites. It took over 65 million square meters of land held by the Urban Land Office, which it can trade with other agencies. It also has access to reclaimed squatter land. TOKİ is responsible for design of social housing, allocation of units to households meeting income criteria, and sales to households above the social housing threshold. Social housing tenants can rent to buy. Through its financing unit, TOKİ offers construction loans to developers and short-duration loans to home buyers. This political positioning and comprehensive approach to housing delivery makes TOKİ a major authority.

Exhibit 76

Turkey's housing authority uses both public-private partnerships and public-sector delivery


Incoming assets
Outgoing assets
Revenue sharing on high-end units (~20% of TOKİ housing projects)
1. TOKİ asks developers to submit plans (based on municipal plans) for high-end housing projects that would provide the highest revenue for TOKİ in exchange for government land
Public ownership of affordable housing units (~80% of TOKİ housing projects)
4. TOKİ asks a short list of developers to submit bids for low cost housing and community projects based on TOKİ and municipal plans, in exchange for government land
High-end private developers
TOKİ
Low-end private developers
2. Developers build required type of project and sell high-end units to high-income customers
3. Developers provide agreed-on portion of revenue from high-end units to TOKİ
5. Using TOKİ's schematic design and requirements, developers build low-end housing and other facilities
High-income households
Low- and middle-income households
6. TOKİ sells or allocates social housing to low- and middle-income consumers

SOURCE: Expert interviews; TOKİ annual reports; McKinsey Global Institute analysis

In Hyderabad, India, the state government assesses betterment levies on real estate near the metro line to help fund construction of the transit system. Some Latin American cities, such as São Paulo and Bogotá, have sold development rights and used betterment levies to finance urban infrastructure. Bogotá financed more than $1 billion in municipal works (mostly street, bridge, and drainage improvements) from 1997 to 2007 through betterment levies. The same mechanism can be used to fund housing.

Apply other cross-subsidies with care

In addition to land-value capture, other types of cross-subsidies can be used to make housing more affordable, but they must be implemented thoughtfully. In many countries, for example low-income households receive water and electricity from the city at rates below cost. Colombia discounts rates on electricity, gas, telephone, and water services by 15 to 50 percent for low-income citizens and applies a surcharge of up to 20 percent for high-income households. While such approaches give important financial relief to low-income households, they are regarded as less useful than vouchers or other income support, since they lead to waste.

Another potential source of subsidy, as noted in Chapter 2, can come through the provident funds like Mexico's INFONAVIT. These funds subsidize below-market mortgage rates for low-income borrowers with below-market returns on savings and retirement. While such approaches can constitute an important funding source, they need to be carefully managed to ensure equitable access to such rates and transparency on the implicit cost incurred.

Use public budgets effectively

There are several ways to use the tax system to fund affordable housing. In addition to simply using general tax revenue to pay for subsidies, such as the housing vouchers and operating subsidies that government housing entities such as the Department of Housing and Urban Development (HUD) in the United States distribute, governments can use tax credits and incentives. The HOME program, another HUD subsidy, provides grants from the federal government to state and local governments for the acquisition, construction, and rehabilitation of rental housing.[91] Cosmo City in South Africa was funded mostly via tax revenues on market rate homes and a range of cross-subsidies on land and infrastructure development. Municipalities, which feel the challenge of affordable housing most intensely, often have limited access to general tax revenues, and those are often fully committed to providing basic services. Cities, therefore, should start exploring other funding options and focus public spending on where they have the greatest leverage—funding the "viability gap" on private development of affordable housing. Cities can also leverage their balance sheets by providing guarantees, rather than supplying cash.

91 Bruce Katz et al., *Rethinking local affordable housing strategies: Lessons from 70 years of policy and practice*, The Brookings Institution Center on Urban and Metropolitan Policy and The Urban Institute, December 2003.

ENHANCE GOVERNMENT PERFORMANCE AND STREAMLINE DELIVERY

In this research, we have reviewed cases of affordable housing delivery and drawn on the knowledge of experts in all areas of housing delivery. We find that around the world, affordable housing delivery is held back by similar issues: a lack of empowered leaders, competing priorities, an absence of effective delivery mechanisms, minimal pressure to perform, large capability gaps, and limited collaboration with external stakeholders. By focusing on these barriers and learning from global and local experience in public-sector system transformation, governments can come closer to solving the affordable housing challenge. The most successful and efficient delivery programs share three common approaches: they clearly prioritize programs and outcomes, they use dedicated delivery units to manage projects, and they apply service operations principles to streamline user processes.

Prioritize programs and outcomes

Given resource constraints, it is important to focus on a small set of programs that are chosen for their high potential return and speed of implementation. By clearly defining outcomes in three areas—affordability threshold, standard unit parameters, and target populations—decision makers can easily identify which programs deserve the highest priority. Additionally, it is important to establish the right outcomes-based metrics for each priority to ensure that delivery efforts have the intended consequences. Effective performance management should characterize the program throughout its life cycle.

To improve delivery, the program should be launched only after a rigorous prioritization process narrows the focus to a set of three to six policies that have the highest potential impact and greatest chances of success. These can involve a mix of delivery models. However, a consumer-led housing delivery model requires very different approaches than a public-sector housing effort. The different models can be effectively combined, but the combination depends on the political and market conditions in the area.

Once the strategy is clearly defined and the specific policies are selected, success metrics should be designed to measure outcomes, not inputs. For example, when measuring the success of the Low Income Housing Tax Credit in the United States, the performance metrics track the utilization of available credits, market share of units financed, fraction of units serving areas of greatest need, compliance levels, returns on the investment in credits, and stakeholder satisfaction. These are all metrics that measure outcomes.

The next step in setting priorities is to develop plans for how the government will deliver on each target. It is very important to outline key milestones, an overall timetable, and the steps that will be taken to reduce risks and address likely constraints. Careful tracking and clear accountability mechanisms allow programs to adapt when necessary.

Use delivery units to manage housing programs

To overcome bureaucratic obstacles and capability challenges, many governments set up dedicated delivery units to manage complex initiatives such as affordable housing projects. These are dedicated government entities that drive performance in specific priority areas. Delivery units bring focused attention to implementation and can facilitate fast decision making by circumventing government bureaucracy.

Delivery units report to senior officials (in some cases to the prime minister) and are usually staffed by highly skilled individuals, chosen from the public and private sectors. Delivery units may be part of an existing affordable housing agency but could also be broader units designed to cut across sectors. No matter where the delivery unit operates and reports, it must be guided by local decision-making.

In Turkey, the TOKİ housing agency, which has facilitated the development of more than half a million homes in less than a decade, reports to the prime minister. Delivery units can operate either centrally, at the national or state level, or within specific city administrations. National delivery units typically report to a prime minister or president and play a key role in determining the national strategy and key priority areas. National delivery units have yielded strong results in Singapore, the United Arab Emirates, the United Kingdom, and elsewhere.[92] Delivery units also can be effective at a state, ministry, or program level. In Singapore, the government holds a 60 percent stake in the development company Surbana, which has built government-financed housing on a massive scale.

Despite variations, successful delivery units share a few key characteristics: they are headed by an outstanding leader with a strong track record of meeting goals, they have direct access to top leadership, and they hire talented staff with great problem-solving and communication skills that they use to influence ministries even when they do not have line authority. Successful delivery units also have a constant mandate, are not too large (typically fewer than 50 members), and have the necessary access to escalate critical issues that cannot be resolved.

Apply service operations principles to ensure timely approval and permitting

Time is critical when developing affordable homes. Each unit delayed by a year means a family residing in substandard accommodation for that year or suffering from stressful financial overstretch. Delays also affect a developer's capital costs between the start of a project and sale of the units. If the timeline is short, developers can sell units at affordable prices without jeopardizing their required internal rate of return. If completion is delayed, the risk rises, which raises the cost of capital and the need for additional working capital. In one project in India, the cost of capital doubled from 15 percent to 30 percent when the project schedule was extended from 24 months to 60 months due to approval delays. This resulted in an almost ten-fold increase in total capital costs, sharply reducing returns.[93] To mitigate these costs and facilitate affordable housing development, governments need to improve their processes and develop a service-oriented approach.

92 *Nigeria's renewal: Delivering inclusive growth*, McKinsey Global Institute, July 2014.

93 Example from Value & Budget Housing Corporation, a leading affordable housing developer in India.

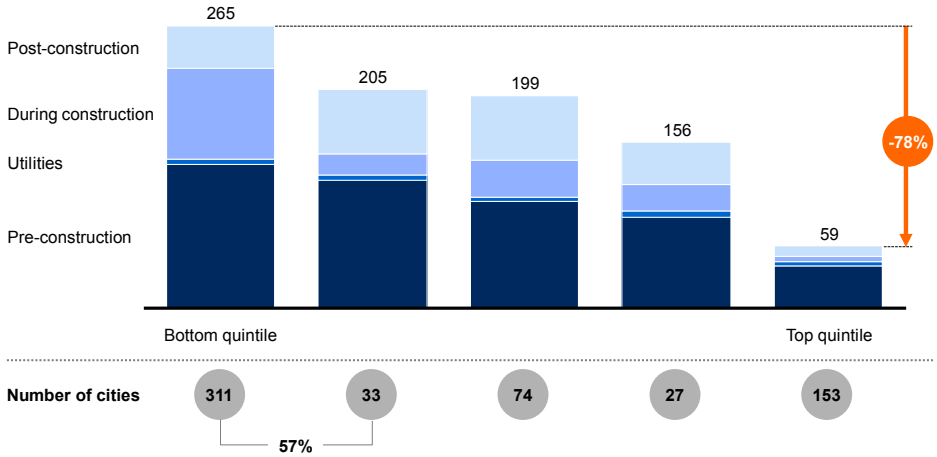
Large cities, particularly fast-growth cities, often have long permitting timelines and complex and costly procedures. A sampling of approvals required across a few states in India suggests that getting a housing project approved and built can take 30 to 70 procedures, including converting the permitted land use, pre-construction clearances (state and local), commencement approvals, completion approvals, and certification of occupancy. The whole process can easily take more than a year. What is most striking in the data is the sharp difference between the best performers and other cities. In top-quartile cities, average permitting time is less than two months—a third of the average (Exhibit 77).[94]

Exhibit 77

There is a difference of about 80 percent in permitting times between best and worst performers

City 600[1] permitting time by country quintiles, 2013[2]

Days



1 The top 600 cities by estimated contribution to global GDP growth from 2007 to 2025, excluding Macau and Havana.
2 Permitting performance refers to time in days to receive all required permits for a standard warehouse, including installation of plumbing, electricity, and a telephone line.

SOURCE: International Finance Corporation; World Bank; McKinsey Global Institute Cityscope database; McKinsey Global Institute analysis

There are several ways in which the top-performing cities streamline permitting and other regulatory approvals related to development: reducing complexity and cost, automating permitting processes, improving online access, adopting standards, or even privatizing permit processing. To reduce complexity, authorities have eliminated unnecessary steps, consolidated procedures in fewer offices or even in a single office, and placed time limits on permit approvals. Some cities have created single-window systems where all processes related to development are consolidated. Another useful approach is to conduct an impact assessment to prioritize improvements in the steps that cause the greatest costs and delays.[95]

94 The World Bank's Ease of Doing Business index measures permitting times for building a warehouse, which we use here to illustrate the issue for house construction.

95 For a review of global best practices, see *Good practices for construction regulation and enforcement reform: Guidelines for reformers*, World Bank, January 2013.

Ukraine reduced permitting times from more than a year to less than three months by cutting in half the number of procedures required and running the remaining ones on parallel tracks. Colombia has privatized construction permitting, contracting with a system of "urban curators" who are authorized to issue permits under government-defined standards. Curators are compensated from a portion of the permit fees. Permitting times in Colombia were reduced from three years to two months, according to the World Bank.

Electronic permitting can enhance efficiency for both the construction industry and regulators. Singapore automated construction permit procedures, completely eliminating paper processes.[96] The City Council of Nairobi also launched an automated permitting process in September 2011, which led to a decrease in approval times for provisional building permit from about 6 months to 30 days.[97]

Expert insight

P. S. Jayakumar, managing director of Value & Budget Housing Corporation of India, an affordable housing builder

Q: What would make private developers of affordable housing more effective?

A: The starting point for this is to streamline land acquisition and establishing clean title. Digitization of land records and providing title insurance will assist in addressing the land acquisition issue. Once land is acquired, the key to success is to have the lowest cost of production. Our vision is to mimic the process followed by auto industry and make construction/delivery of home a very controlled and predictable process. This includes standardization, industrialization, and lean management techniques. Software, processes, and other technology have advanced so it is possible to design and build high-quality buildings while adhering to sustainability/green building standards. Our approach is to have prototypes built for each type of unit and use-model several hundred thousand simulations to determine the optimal placement and type of buildings. Manufacturing and off-line assembly of key components together with *in situ* construction has enabled us to optimize cost and delivery time, while maintaining consistent quality.

Next, building an enabling environment is perhaps the most important support that is required and arguably even more important than revenue concessions. From a private developer's point of view, the timeline for completion of an affordable housing project has to be minimized. Approval times need to be very short—a long lead time would increase the cost of capital and wipe out any profits. Building codes have a significant impact on cost. There is a need for standardization of bylaws and building codes across cities, so that developers can plan for large-scale developments in standardized manner.

96 *Good practices for construction regulation and enforcement reform: Guidelines for reformers*, The World Bank, January 2013.

97 Ibid.

4. Strategies and tools to tackle affordable housing: City case studies

Crafting and executing housing policy has been a challenge around the world. The approaches and the delivery platform described in this report can be used to reduce the cost of housing and improve housing outcomes, helping more people find decent, affordable housing. However, they are only the toolkit. Meeting the growing housing challenge will require applying these tools in wholly new ways, with the broadest possible vision of what housing policy can do. Moreover, these are not stand-alone tools but should be used in combination to address the problem of affordable housing (see Box 14, "Eight approaches for designing successful housing programs").

Box 14. Eight approaches for designing successful housing programs

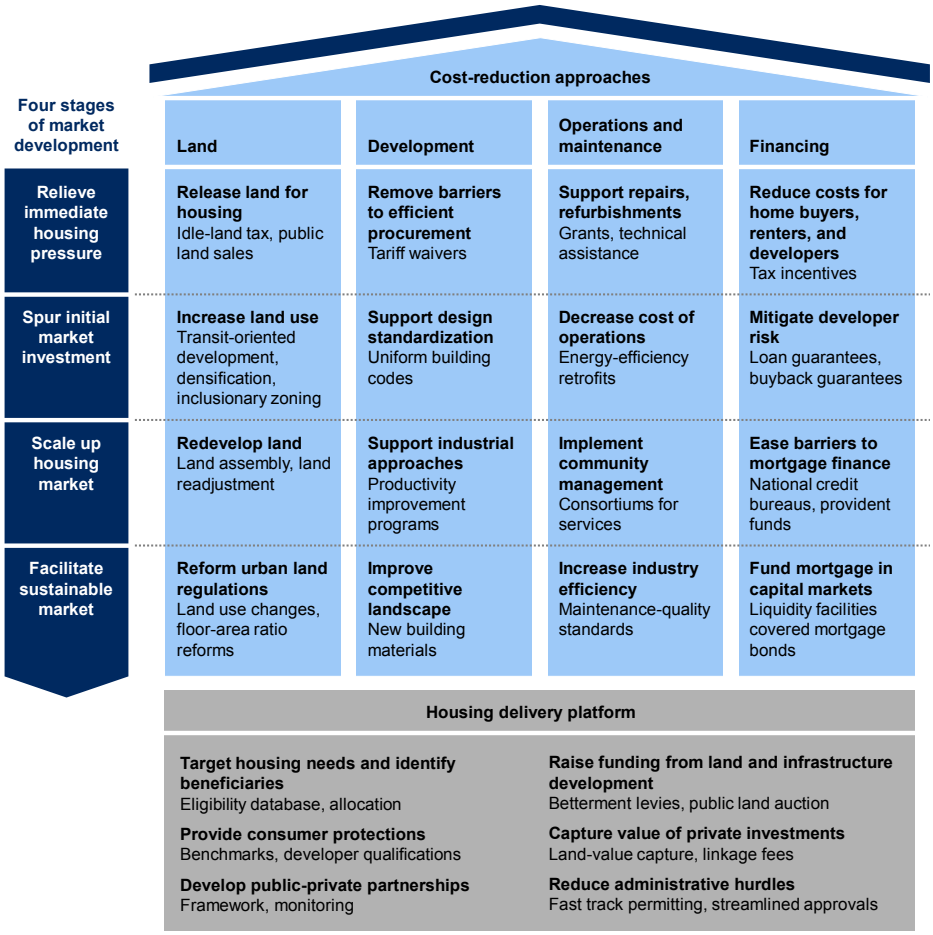
In crafting the policy that guides city housing programs, which can be implemented using the four approaches described in Chapter 2, policy makers should:

- **Set policy at the city level.** Clearly there are universal factors (and solutions) in the affordable housing challenge. But every city is a unique market, with its own land-market characteristics, economic issues, demographics, housing stock, and regulations. Policy can succeed only if it is based on a detailed understanding of the city where it is to be implemented.
- **Funding follows function.** Too often a narrow view of the options to provide housing leads to the assumption that funding gaps—due to insufficient public resources—preclude action. Thinking more broadly about what can be done across the housing ladder can help cities identify other sources of funding.
- **Focus on location.** Nothing can overcome the problems caused by housing in the wrong location. There must be access to education and social resources, as well as to transportation to centers of employment.
- **Make employment and socioeconomic integration priorities.** Providing a clean, decent place to live can relieve suffering and improve health. Creating housing where residents can connect to employment and social services enables poor citizens to climb the socioeconomic ladder.
- **Enable housing for all.** Housing policies that focus solely on building units to house the poorer segments of the population miss a larger opportunity. Making it more efficient to build and operate housing across the city can benefit all segments, including by making old stock available for different kinds of households.
- **Design an integrated approach.** To achieve significant results, cities need an integrated approach that coordinates policy and initiatives in multiple areas: land, development, operations, and finance.
- **Encourage efficiencies across the housing value chain.** The better the housing sector functions, the better the chances are that the city can close its affordable housing gap. Measures such as certifying builders and maintenance services can raise standards, increase transparency, and promote healthy competition.
- **Empower communities.** Ultimately, successful housing policy is about building and strengthening communities. Involving community members in critical decision processes and generating grassroots demand and support for housing initiatives can lead to better outcomes.

In this chapter, we assess how the housing sector is managed and how that affects affordable housing in three cities that represent different stages of economic development: New York City, Pune in India, and Lomé, the capital of Togo. For each, we size the affordable housing gap, lay out the applicability of some levers, and provide an overview of current housing programs. In addition, we provide a detailed overview of Singapore's comprehensive public-sector housing program. These case studies have been conducted outside-in to illustrate the diversity of housing challenges. By seeing how different tools are applied in four distinct settings, we showcase how the approaches laid out in this report can be used in cities spanning a wide range of income levels and institutional characteristics. The framework shown in Exhibit 78 illustrates how strategies can be phased in to match the evolving needs of the city. Appendix B ("Detailed list of sub-levers for reducing housing costs") provides additional detail on implementing affordable housing strategies.

Exhibit 78

Applying the approaches to reducing housing cost through four stages of market development



SOURCE: McKinsey Global Institute analysis

New York: A multi-sector approach to affordable housing

New York is one of the most expensive cities in the world. It is a global center for finance, media, technology, and fashion that offers unique cultural amenities. It is also a city of extremes. Manhattan's Upper East Side is the center of the nation's wealthiest congressional district; less than five kilometers to the north is the South Bronx, the nation's poorest. Nearly half of all New Yorkers are inadequately housed or are financially stretched by the cost of housing. Even in middle- and upper-income groups, nearly a quarter of residents pay more than 30 percent of pre-tax income for housing. Here we look at the size of the challenge and at a plan proposed by the city's administration to accelerate creation of affordable housing that would employ the methods we have described for delivering affordable housing.

DEFINING THE CHALLENGE: ABOUT HALF OF NEW YORKERS HAVE INADEQUATE HOUSING OR ARE FINANCIALLY STRETCHED

We estimate that half of New York households cannot afford basic housing using 30 percent of their income. In New York City, median household income is $51,000. If we define low-income households as those earning 80 percent of the median, 1.2 million households (of about 3.1 million) would be classified low-income.

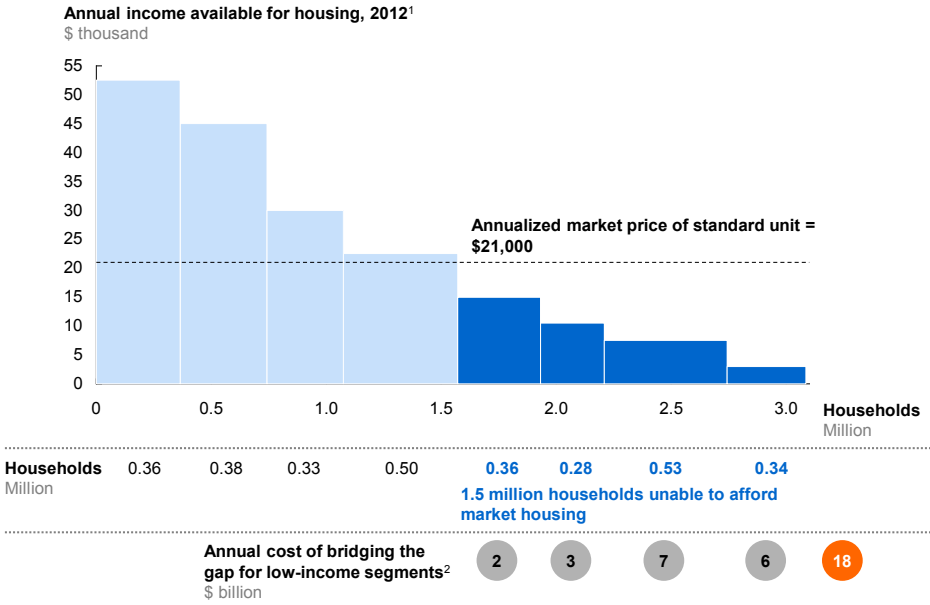
In New York, we assume adequate space for an average household of three is 90 square meters, or about 968 square feet, in line with existing housing under programs such as the Mitchell-Lama affordable housing initiative enacted in the 1950s. We define adequate accessibility to services as having public transportation that can carry residents to jobs within one hour, K–12 schools within 4 kilometers, and primary health-care facilities within 17 kilometers. These local standards are based on available housing in typical lower-income New York neighborhoods.

We estimate that a standard apartment that meets our criteria for decency and accessibility would cost $21,000 per year, or $1,750 per month. This is based on current market prices; rentals might be less expensive (but subject to increases), and properties acquired with mortgage financing (cooperatives and condominiums) may cost more. At current income levels, 1.5 million households cannot afford basic housing at these rates. We estimate that the affordability gap is about $18 billion per year (Exhibit 79). This represents about 4 percent of New York City's GDP.

This ties well with current statistics, about 1.6 million households in New York City face housing challenges across different housing categories (Exhibit 80). About 55 percent of renters and 50 percent of households with mortgages are financially stretched, paying more than 30 percent of income on housing costs.

Exhibit 79

At current market rates, 1.5 million New York City households cannot afford a standard unit—an $18 billion annual economic gap



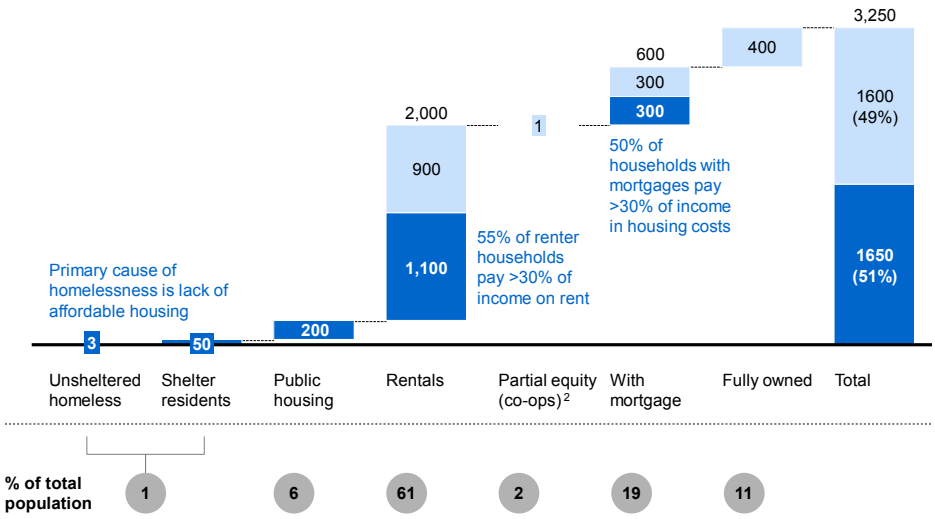
1 30% of annual pre-tax household income assumed to be allocated for housing costs.
2 Cost of bridging the gap is the amount of money needed to bring the annual Income available for housing of all the low-income households to the market annualized cost of a standard unit.

SOURCE: US Census Bureau and US Department of Housing and Urban Development; McKinsey Global Institute analysis

Exhibit 80

In New York City, half of the population faces affordability issues, across housing categories

Number of households in New York City by housing category
Thousand households[1]



1 Converted from population using 2.7 people/household except for unsheltered homeless and shelter residents.
2 Mitchell-Lama Co-ops.
NOTE: Numbers may not sum due to rounding.

SOURCE: New York City Department of Homeless Services; Coalition for the Homeless; New York University Furman Center for Real Estate and Urban Policy; US Census Bureau, 2012; McKinsey Global Institute analysis

Housing issues affect low-income households disproportionately: 89 percent of households earning less than 30 percent of area median income are financially stretched by housing costs. Of households earning 30 to 50 percent of area median income, 83 percent are financially stretched by housing costs, and 66 percent of households earning 50 to 80 percent of area median income pay more than 30 percent of income for housing. Close to 100,000 renter households, or 4 percent, live in severely overcrowded units with more than 1.5 persons per room. And some 60,000 households in New York City, or about 2 percent, live in housing that does not meet minimum standards for basic amenities set by the US Department of Housing and Urban Development. These homes have severe defects, such as non-functioning plumbing or inadequate and dangerous wiring.

Rising costs mean that low-income families also face a constant threat of unaffordable rent increases and possible eviction. While half of renters are covered by rent control or rent stabilization rules, those schemes offer limited protections. Also, they no longer apply when monthly rent reaches $2,500 or when properties exit programs that offer owners tax benefits for providing affordable housing, at which point rents can rise to market rates and longtime tenants are often forced to relocate.

Financial overstretch extends into middle- and even upper-income groups because of New York's soaring housing costs. In New York, 63 percent of moderate-income households (about 350,000 households with incomes of about 80 to 100 percent of area median income) pay more than 30 percent of pre-tax income for housing. About 23 percent of New York's 1.6 million middle- and high-income households (earning 100 percent or more of area median income) spend more than 30 percent of pre-tax income on housing.

A clear cause of the steep increase in the cost of housing in New York is the relatively slow pace of new construction. From 1994 until 2008, housing starts rose from 4,000 units per year to 34,000, but they dropped by 85 percent in 2009 and have not recovered. As a result, between 2005 and 2013, only one new housing unit was added for every four persons added to the population. Meanwhile, the supply of affordable rental units contracted as 150,000 apartments were removed from rent-regulation programs.

HOW THE PLAN FOR ADDING 200,000 AFFORDABLE HOUSING UNITS WOULD ALIGN WITH OUR APPROACH

In May 2014, Mayor Bill de Blasio announced a ten-year plan to create 80,000 new affordable housing units and preserve 120,000 existing units.

Aspiration and targets

About 60 percent of the 200,000 units are targeted at households earning between 50 and 80 percent of median income. About 20 percent of units would be for the very low-income segment (31 to 50 percent of median income) and the extremely low-income segment (30 percent of median income or less). The remaining units would be allocated to moderate- and middle-income households (80 to 165 percent of median income).

We estimate that 1.5 million households in New York City cannot afford market-rate housing at current rates. By 2025, affordability requirements that were imposed in exchange for incentives such as tax breaks will expire for around 100,000 of the city's 1.6 million affordable units (nearly as many as the plan hopes to preserve).[98] And, based on population and income projections, 110,000 more low-income households will likely be in need of affordable units in 2025. The mayor's plan takes a very systematic approach to preserve affordable housing and accelerate additions to the affordable housing stock. However, our analysis suggests that if factors such as income growth remain on current trajectories and no additional measures to induce private investment (additional tax incentives, for example) are introduced, a gap will likely remain.

Land

New York is highly built up, but there are still opportunities to secure land for affordable housing. About 42 square kilometers of land remain vacant in New York. Of this, 26 square kilometers is zoned for residential purposes—around 10 percent of total developed residential land. While New York has many high-density neighborhoods, the city has greater variation in zoning densities and significantly lower permitted densities in outlying areas than global cities such as Singapore, which has similar overall population density. Also, only 86 percent of the allowed floor-area ratio is being utilized across the city. If densities were fully utilized (within the limits that infrastructure can support) and the value could be captured for affordable housing, the city could open up new development to help reduce the city's affordable housing gap.

The mayor's plan identifies several specific opportunities. These would include infrastructure investments (upgrades to storm water and sanitary sewers, construction of new streets and open public spaces), which could raise the value of land in Hunter's Point South in Queens, Stapleton on Staten Island, and parts of Coney Island in Brooklyn, and make those areas potential sites for affordable housing. There are also plans to spark transit-oriented development by adding 13 bus rapid-transit (Select Bus) routes.

Two new programs are aimed at aggregating small sites for affordable housing: the Neighborhood Construction Program for rental housing and the New Infill Homeownership Opportunities Program for ownership housing. In these programs, sponsors such as financial institutions would purchase and aggregate small land parcels and let developers construct projects with up to 20 affordable housing units each. In addition, the city will consider other means to develop new land for affordable housing, such as using land banks, reclamation, or infrastructure decking (constructing housing on top of infrastructure such as rail lines). The city plans to offer financial incentives and administrative support to facilitate environmental brownfield remediation and look for ways to release public land for development.

To unlock privately owned land, the city says it will re-examine its idle-land policies and consider a new land assembly program. It also intends to review zoning to create opportunities for density bonuses that could provide land for affordable housing. In the meantime, the city says it will ensure that the terms of the Inclusionary Housing Program (which provides density bonuses to

98 *A permanent problem requires a permanent solution: New York City's next affordable housing expiring-use crisis and the need for permanent affordability*, Association for Neighborhood and Housing Development, spring 2010.

developers) are being met. Finally, the city aims to recalibrate the Inclusionary Housing Preservation Program to make sure it fulfills its goal of preserving affordable housing.

Development

The plan envisions reducing construction costs by revising regulations, introducing new technology, and pursuing competitive pricing. An initial step is a study of building and fire codes to assess potential changes that can reduce costs without jeopardizing safety. The city also plans to expand the pool of subcontractors it uses, including small businesses to encourage more competitive pricing. A joint effort by the city, developers, construction and building trades, and the Building Department is aimed at removing inefficiencies in permitting and encouraging the use of new construction technology. Wider adoption of industrial approaches is not explicitly addressed in the de Blasio plan. Industrialized approaches to construction may be more difficult to apply in New York, where most development is mid-rise and high-rise infill rather than greenfield low-rise developments, but they have been applied successfully in several cases. However, additional opportunities for industrial construction, design standardization, and value engineering can still be explored.

Operations and maintenance

The plan introduces a program to accelerate investments in energy efficiency and resource conservation and uses liens against landlords to enforce compliance with maintenance and repair standards. The conservation plan provides financial assistance and grants to accelerate investments in energy and water efficiency projects and fund retrofits. To encourage proper maintenance and tenant safety and to prevent housing from becoming uninhabitable, the city will intervene if a landlord fails to perform necessary repairs. The city will pay for the required services and place a lien against the property. Enforcement of such liens could result in properties being sold to responsible new ownership. The city would facilitate such transfers and encourage new owners to repair the buildings and devote some portion of the property to affordable housing.

Financing

The New York affordable housing program does not explicitly lay out new financing schemes for homeowners or renters but will build on the existing well developed US mortgage market as well as HUD-administered subsidies. To provide developers with financial incentives to build affordable units, the city is looking at relevant tax programs. This would include harmonizing a tax exemption for new multifamily dwellings on vacant land with the city's inclusionary housing programs. Another tax exemption and abatement for residential rehabilitation or conversion would encourage creation of more affordable units. The tax credit for low-income housing created by charitable organizations can be made more effective and could be focused more on the provision of affordable housing. Finally, the city can make development of affordable housing more attractive by lobbying the federal government to allow income averaging among tenants in buildings using the Low Income Housing Tax Credit, which would allow a wider range of incomes within a low-income development, as long as average income remains no more than 60 percent of the area median.

Housing delivery platform

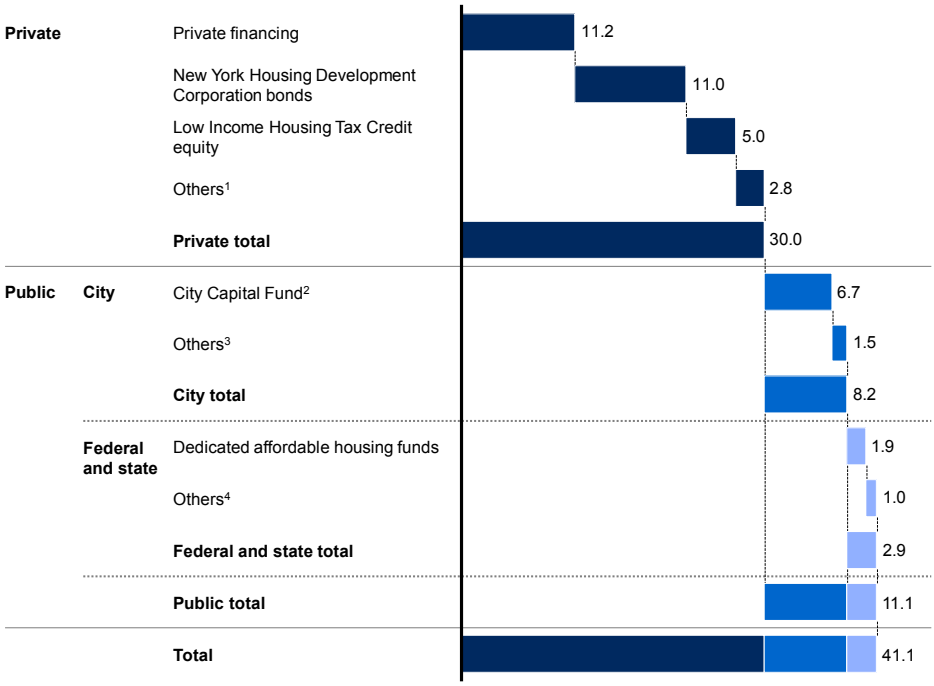
The de Blasio plan is estimated to require investments of $41 billion over ten years. In line with historic approaches, the city's plan focuses on incentives for private development. About $30.6 billion would be invested in new construction, and about $10.5 billion would be applied to preservation. About 75 percent of the total investment is expected to come from private sources (financial institutions, pension funds, financial intermediaries, and philanthropies) and the rest from city and federal sources (Exhibit 81). In addition, there would be cross-subsidies arising from density bonuses.

Exhibit 81

Most of the financing for New York City affordable housing would be private

Source of financing of the plan, 2015–24

$ billion



1 Pension funds, Housing Finance Agency bonds.
2 Generated though the issuance of general obligation bonds.
3 New York Housing Development Corporation contribution and securitization, 421-a Fund, and others.
4 HOME Program, state funding, Lower Manhattan Development Corporation.
NOTE: Numbers may not sum due to rounding.
SOURCE: *Housing New York: A five-borough, ten-year plan*, City of New York, 2014; McKinsey Global Institute analysis

As noted, the mayor's plan calls for a review of permitting processes by the city and other stakeholders, including the construction industry. The city plans to automate filing, reviewing, approval, and permitting processes and to expedite reviews. Streamlining the approval process for inclusionary zoning will be a priority. The city is committed to adopting the Uniform Land Use Review Procedure, which is aimed at shortening the timeline of development permits. The city says it can reduce the time for reviews for land use and environmental applications by 25 to 50 percent. In addition, the city says it will review zoning and other relevant regulations with an eye toward reducing costs and improving investment opportunities—easing off-street parking requirements, reconsidering zoning envelope constraints, and examining restrictions on the transferability of development rights.

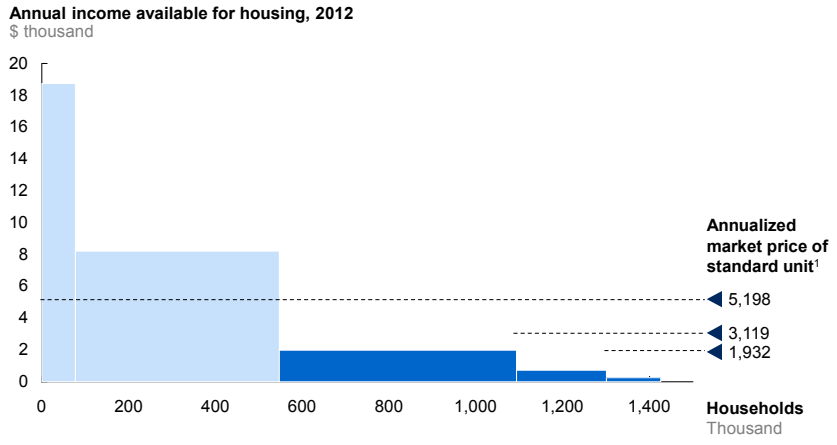
Pune, India: A comprehensive approach to slum redevelopment

Pune is the seventh-largest city in India and second largest in the state of Maharashtra. Known for its educational institutes and universities, Pune has emerged as a popular location for manufacturing and information technology companies. It also has a severe housing shortage, with an estimated 1.2 million of 5.7 million individuals in the Pune metropolitan area, or about 21 percent of the population, living in slums. In Pune City, the share of slum dwellers in the population is higher at 33 percent.[99] These slums are crowded onto less than 2.5 percent of the land area, which means a population density of about 194,000 people per square kilometer, more than seven times that of Manhattan. Housing affordability is an issue across higher-income populations as well.

We estimate that up to the middle-income level (households making up to $9,370 in 2012 prices), or about 62 percent of the population is unable to find basic housing at prevailing market rates.[100] This means an affordability gap of about $2.5 billion in 2012 for the metropolitan area—nearly 14 percent of an estimated $18 billion total GDP (Exhibit 82).

Exhibit 82

Pune's economic affordability gap is about $2.5 billion a year



Income segment[2] $ per annum, 2012 prices[3]	High income 2 >18,730	High income 1 9,370–18,730	Middle income 3,750–9,370	Lower income 1,870–3,750	Economically weaker <1,870
Households Thousand	80	470	545	210	125
			880,000 households unable to afford market housing		
Annual cost of bridging the affordability gap $ billion			1.8	0.5	0.2	2.5

1 Residential space requirements based on Maharashtra Housing and Area Development Authority norms.
2 Definitions based on Government of India norms.
3 $1 = 53.38 rupees; based on 2012 average.
SOURCE: Census 2011; National Sample Survey 2012; McKinsey Global Institute analysis

99 The Pune metropolitan region (PMR) consists of Pune City (which comes under the Pune Municipal Corporation or PMC); Pimpri-Chinchwad Municipal corporation (PCMC), which has seven key towns including Pimpri and Chinchwad; Khadki; Dehu; Pune cantonment; and about 100 other towns and villages. Altogether, PMR covers a land area of about 1,340 square kilometers.

100 Unit size of basic housing for different income levels as defined by Maharashtra Housing and Area Development Authority.

DESPITE A RECENT FOCUS ON AFFORDABLE HOUSING, DELIVERY OF NEW UNITS HAS BEEN LIMITED

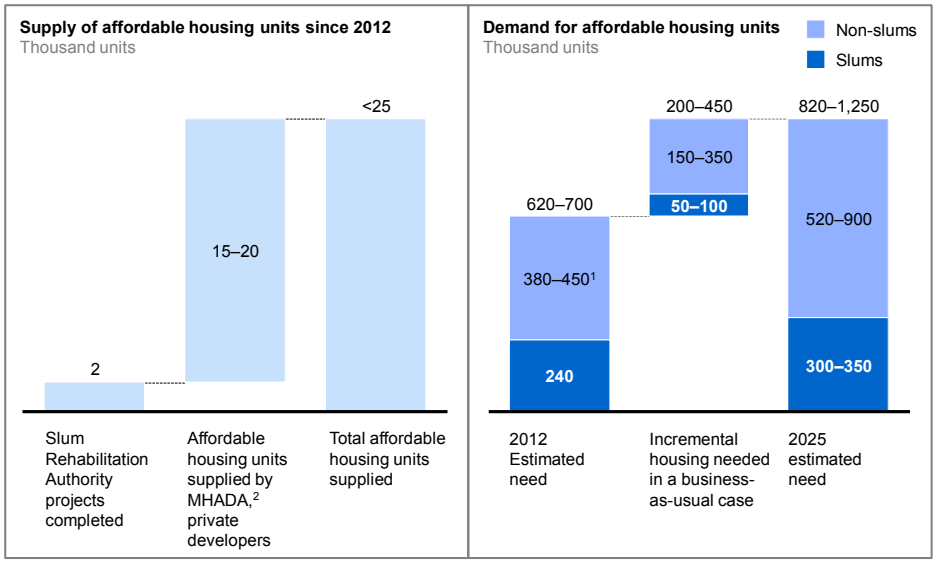
The state of Maharashtra has undertaken an ambitious slum rehabilitation program, establishing the Slum Rehabilitation Authority for Pune and Pimpri-Chinchwad. In addition, the state government builds affordable housing units through the Maharashtra Housing and Area Development Authority (MHADA). To encourage private development, the agency is offering density bonuses, raising the floor-area ratio to 2.5 for slum rehabilitation projects (with a proposal to raise the ratio further to 3.0). The agency also has invited private builders with plots of more than 2,000 square meters to enter joint ventures to produce new housing, and it now requires any residential development of more than 4,000 square meters to dedicate 20 percent of units to affordable housing. MHADA is also exploring new construction technologies such as prefab and pre-cast components.

Market forces have also improved the potential for affordable housing recently. Developers had focused on the more profitable upper-middle and high-income segments until the market for high-priced homes contracted in 2008 and 2009. Since then, many companies have pursued growth opportunities in lower-income segments. As a result, many new players in Pune's real estate market, such as Vastushodh, Maple Group, and Xrbia, are active in affordable housing ventures. Some of these are being backed by private equity funds such as Avenue Venture and Brick Eagle Capital Advisory. Vastushodh has completed 1,700 housing units at multiple locations in and around Pune. Xrbia Hinjewadi, backed by social housing funding company Brick Eagle, is expected to build 4,000 houses priced from Rs. 900,000 ($17,000) to Rs. 3 million ($56,000).

By 2013, however, the slum rehabilitation initiative had helped only an estimated 2,100 families move into new housing. It is estimated that private builders have constructed fewer than 10,000 affordable housing units, predominantly for the higher end of the affordable market. Some 240,000 households remain in slums and more than 600,000 households are in need of quality affordable homes. By 2025, this gap could reach 1.2 million affordable homes, creating an urgent mandate to speed up delivery of new housing (Exhibit 83).

Exhibit 83

Pune metro would need to add 100,000 affordable units per year to avoid a 1 million–unit gap by 2025



1 We estimate that 62% of population cannot afford basic housing at market rates. However, this may be overstated given the increase in home values in recent years and homes families have inherited. Thus, demand estimates are based on assumption that 45–50% of the population needs quality affordable housing.
2 Maharashtra Housing and Area Development Authority.
NOTE: Numbers may not sum due to rounding.
SOURCE: Slum Rehabilitation Authority of Pune; Mashal; Pimpri-Chinchwad Municipal Corporation (PCMC); McKinsey Global Institute analysis

INTERVENTIONS THAT COULD ACCELERATE DELIVERY IN THE AFFORDABLE HOUSING PROGRAM

The four approaches that we describe in Chapter 2 are relevant to Pune's affordable housing efforts. By making more land available, adopting more efficient construction methods, reducing costs of operations and maintenance, and expanding access to affordable financing, Pune can make better progress in closing its affordable housing gap.

Land

Land is a key constraint in the Pune metropolitan area, especially within the Pune city limits. Land prices have risen by 1.5 to three times in the past five to seven years, making the challenge of closing the affordable housing gap even greater. We propose three approaches that could help make land available: clarify government policies and guidelines for development of affordable housing units, accelerate slum redevelopment, and unlock any idle government land and maintain a land database for affordable housing planning.

The recently adopted Maharashtra policy to reserve 20 percent of the area for affordable housing for projects of more than 4,000 square meters has not yet resulted in any significant additions to affordable housing in Pune. Developers, builders, and analysts cite ambiguity in the regulations as a reason for the slow progress.

The limited availability of land in the city can be partly overcome by accelerating slum rehabilitation schemes. Through this approach, slum dwellers are able to get access to improved housing and better basic services, such as sanitation, sewerage, electricity, and drinking water, where they live. More than 2,000 houses were constructed in the slum redevelopment project at Yerwada, in Pune, which involved non-governmental organizations (NGOs), private contractors, beneficiaries, and government authorities. This model could be replicated in other slums. To free up more land, the city can identify contiguous land that is available for purchase and work with the state revenue department to unlock idle government land. In addition, when appropriate land is identified, the acquisition process can be accelerated. For example, of the 609 plots of land (totaling about 10 square kilometers) earmarked for civic amenities in the 1987 development plan, the Pune Municipal Corporation has developed only 134 on 1.34 square kilometers. The administration attributes this slow progress to a tangle of legal procedures that have tied up land acquisition.

Development

Currently, new construction techniques are in limited use in housing construction in Pune. Private players such as Xrbia use *in situ* manufacturing techniques and prefabricated components to shorten construction times. But there has been no concerted effort to adopt these practices on a large scale to reduce time and cost and make building affordable housing more economically feasible. With the scale of construction needed to overcome the current affordable housing shortage, it is imperative that the new construction techniques be put to use to reduce construction time and cost. If certainty of scale can be provided through government support and if regulations can enable design standardization, private developers can be encouraged to adopt industrial approaches.

Operations and maintenance

Taxes and other government fees can make the cost of living in a home with affordable rent or mortgage payments unaffordable. For example, affordable houses built by the government in India can be expensive to occupy because of property taxes. In Mumbai, families earning between Rs. 8,000 and Rs. 20,000 per month ($150 to $375) were allotted houses by MHADA with monthly maintenance of Rs. 5,400 to 5,500 ($100), of which property tax is Rs. 2,500 to 3,000 ($47 to $56).[101]

Any move to reduce the tax burden will require a coordinated approach across national, state, and local authorities. A property tax break for affordable housing would reduce revenue for already cash-strapped local governments. Therefore, the cost of any cuts would need to be matched with support from the central and state governments.

101 Manasi Phadke, "For these winners, MHADA flats are high-maintenance," *The Indian Express*, July 4, 2013.

Financing

In 2012, the Reserve Bank of India allowed developers and housing finance companies to raise up to $1 billion annually from foreign investors for affordable housing under the External Commercial Borrowings program. In 2013, the bank loosened builder qualifications for the program from five years of experience to three and withdrew the minimum capital requirement. It was estimated that in 2013, access to foreign loans, which carry lower interest rates than are available domestically, had the potential to cut the cost of funding for developers to 9 to 11 percent a year (including currency hedging costs), from the prevailing 15 to 20 percent rate.[102]

For home buyers, the Indian government provides a subsidy of 5 percent on interest charged on the admissible loan amount (available to households earning up to $3,750 per year in 2012 prices).[103] However, the borrower must have access to credit to take advantage of the program, which is unlikely for many Indians who are in need of affordable housing. Despite significant growth in housing credit, it has not penetrated the poorer segments of Indian society. Mechanisms to ensure improved access to credit for lower-income groups are needed. Possible solutions could include specific targets for loans and advances to the low-income households and promotion of micro lenders in the housing finance market that could serve low-income households. In 2012, the National Housing Bank of India, Genworth, International Finance Corporation and the Asian Development Bank launched India's first mortgage guarantee company to offer credit risk coverage to banks and housing finance companies in case of borrower default.

Housing delivery platform

To execute the measures outlined above, the city and state would need to put into place important enablers, such as streamlined permitting, better tracking of federal development funds, and improved governance and stakeholder involvement.

- **Permitting.** It has been reported that an automated building plan approval system created by the Pune Municipal Corporation has reduced permitting time to 21 days from 45 to 50 days.[104] This reform is commendable and a key step toward addressing the complex and lengthy approval system. A related improvement would be to standardize bylaws governing these processes across Indian cities and states. Many bylaws, which differ across cities, determine both the building design and master plan. Uniformity in bylaws can go a long way toward making the planning and approval process efficient, reducing interpretation of bylaws at the local level, and allowing for improved productivity in public administration.

- **Tracking and monitoring of funds.** Central funds released under the Jawaharlal Nehru National Urban Renewal Mission are a key source of funding for Pune's developmental projects, including affordable housing. However, poor planning, execution and monitoring of projects and funds have reportedly

102 M. Allirajan, "Easing of external commercial borrowings norms positive for low-cost housing projects," *The Times of India*, June 26, 2013.

103 Interest Subsidy Scheme for Housing the Urban Poor, 2012.

104 Task force on promoting affordable housing, Government of India, Ministry of Housing and Urban Poverty Alleviation, November 2012.

resulted in ineffective utilization.[105] It is therefore important to measure and track progress of federal and state fund allocations, along with regular public reporting of milestones reached and efficiency of fund utilization. Effective utilization of funds and progress can form the basis for seeking greater allocation of resources from the central government and the state.

- **Community engagement.** The successful *in situ* redevelopment of slums in Yerwada showcases the need for multiple stakeholders to come together to close the affordable housing gap. The NGOs played a pivotal role by acting as a bridge between the local government and the slum community. The Pune Municipal Corporation provided a transparent process of beneficiary identification, NGO selection, and contractor identification. This project demonstrates the need for the local government to foster inclusion in slum rehabilitation. It is also important that the involvement of NGOs and developers be formalized in a manner that reduces risk and incents participation. A well-structured process of developer qualification and selection, as highlighted in Chapter 3, is crucial.

Lomé, Togo: Using public-private partnerships to spur the real estate sector

Togo, in West Africa, is one of the poorest countries in the world, with per capita GDP of less than $900.[106]. An estimated 62 percent of the urban population lives in slums, according to UN-Habitat. The capital, Lomé, is home to more than 1.5 million people, or about 20 percent of the population, and decent housing is in very short supply; only about a third of households have access to sanitation, running water, and electricity. The population is projected to grow rapidly and should reach close to 2.8 million by 2025.[107] More than 80 percent of the population cannot afford a decent housing unit, and we estimate the current housing gap is 230,000 units. This gap is equivalent to about $140 million per year, or 4 percent of Togo's total GDP (Exhibit 84). Based on current trends, the gap could grow to about 400,000 units by 2025.

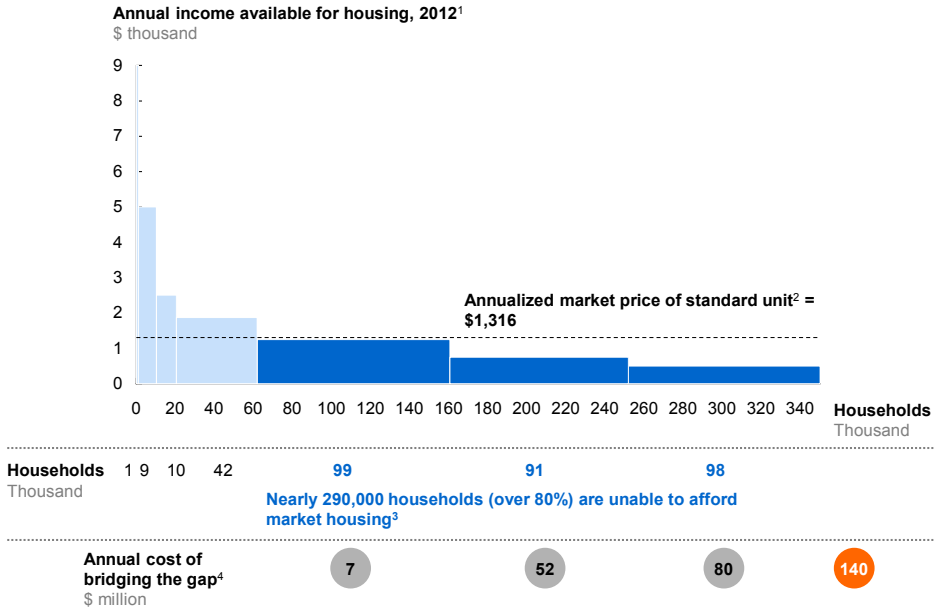
105 Sukirt D Gumaste, "As JNNURM funds dry up, civic body springs into action," *Pune Mirror*, June 28, 2014.

106 Valentina Pasquali, "The poorest countries in the world," *Global Finance*, September 29, 2014.

107 *State of the world's cities 2012/2013: Prosperity of cities*, UN-Habitat, 2012.

Exhibit 84

In Lomé, Togo, more than 80 percent of households cannot afford standard housing at market rates—an economic affordability gap of $140 million per year



1 30% of annual pre-tax household income assumed to be allocated for housing costs for households earning >$7,500 annually and 25% for households earning <$20,000 annually.
2 Standard unit costs $12,000 at market rates, assuming 15-year mortgage at 10% interest.
3 Some households below the affordability level may currently live in affordable units because of market conditions when the unit was purchased.
4 Cost of bridging the gap is the amount of money needed to bridge the annual income available for housing of all low-income households to the market annualized cost of a standard unit. In Lomé, this is $140 million, which represents 4% of GDP in 2012.

SOURCE: Canback Global Income Distribution Database (C-GIDD); McKinsey Global Institute Cityscope database; expert interviews; McKinsey Global Institute analysis

THE POTENTIAL FOR NARROWING LOMÉ'S AFFORDABILITY GAP

A housing challenge like Lomé's can be only partly addressed by the levers we have identified; broader economic development will be needed to raise income levels and help the city's people find decent housing. But significant improvements are possible using the approaches we outline for reducing housing costs. By making land available for development and reducing construction costs, the price of a unit could be brought down considerably. In addition, Togo can start to improve access to the long-term capital that is typically needed for housing. A major initiative by the government is currently underway, including a public/private affordable housing program and a comprehensive set of incentives for developers.

The government of Togo has decided to address the housing challenge by putting in place an affordable housing program and is looking to attract international developers, through public/private partnerships. The government is identifying available land, providing a fiscal incentives package, signing agreements with banks to commit to real estate lending, and working to accelerate key approval processes. The goal is to address the shortage and establish the foundations of a modern real estate industry. The government has already started to prepare for the first development of around 10,000 units in Lomé and is expected to

begin construction in 2015. One objective is to use the public/partnership to demonstrate the real estate business opportunities in Togo, attract international developers, and improve the capabilities of local construction firms.

Land

Housing development in Lomé is held back by policies and practices that limit the amount of land that is available for development. Public land—both newly assembled plots and repurposed government-owned land—could be significant sources. More than 90 percent of land in the city is not registered. However, across Togo, land is held collectively by traditional communities and allocated to individuals by the principle of first occupancy. Land passes to other family members through inheritance. The land-registration system is weak and it takes an average of 290 days—and as long as five years in extreme cases—to register a property (Exhibit 85).[108]

Exhibit 85
Improvements in seven administrative procedures could help speed up development

	Parties involved			
	Administration	Developer	Household	Comments
Land purchase	●	●		"Weak checks of vendor status mean the same property can be sold twice" – Notary
Registration	●	●		"Registration can take 3–5 years as compared with the official 8 months" – Notary
Environmental and social impact report	●	●		"One of the main hurdles" – Developer
Building permit	●	●		"More than 12 months after application—for no reason" – Developer
Subdivision and conformity certificate	●	●		"No mandatory deadlines" – Notary
Mortgage charge	●		●	"Up to 2 years to process a request" – Notary
Sales to individuals	●	●	●	"Lots of different routes and contacts, time varies" – Notary

SOURCE: Interviews, McKinsey Global Institute analysis

108 *Doing business 2013: Smarter regulations for small and medium-size enterprises*, World Bank, 2012; interviews of the order of Togolese notaries.

We identify three ways in which access to land for housing can be improved in Lomé: clarify which parcels of land are owned by the public, reform the land-registration system, and update land-use rules to "re-densify" the city.

- **Inventory public land.** To begin to tackle the land challenge, the government can identify land that is owned by the state and is vacant or can be vacated relatively quickly.[109] Large parcels of government-owned land in the center could be unlocked by moving some uses further out. In addition, the state can take non-urbanized land outside Lomé to accommodate future growth, set it aside for housing, and begin planning necessary improvements, such as extending water, sewer, and electricity lines. The government is working on identifying potential land and has already set aside 0.12 square kilometers for its public/private affordable housing initiative.

- **Formalize land registration.** Formalizing the land-registration process would reduce costs for individuals and developers, but it will be a long and expensive process, requiring an overhaul of land-use regulations and investments in new capabilities and technology. In the short term, workers in the Togolese Department of Cartography and the cadaster (land registry) can be given better tools and training and can start using geographical information systems and computerized records. There are plans to digitize the land-registration system, which could greatly increase efficiency. The city can also enforce regulations on land that is already registered. Finally, the city can work with the courts to speed up adjudication of land disputes, which account for 80 percent of litigation in Togo. This would free up the courts to make judgments on deeds of sales, building confidence in the system. At the same time, reduced costs for title searches and other procedures that property buyers require would encourage more formal transactions.

- **Increase density.** Density in Lomé has decreased from 235 people per hectare in 1920 to 64 in 1981, and 55 today. New guidelines could increase the density of land, particularly in the city center, and begin to change development patterns to build urban neighborhoods where residents can easily reach employment and vital services, such as schools and health facilities. Today, the floor-area ratio in Lomé is about 0.3, which can be increased as development patterns become more structured. Guidelines allowing for, or even requiring, more density will also increase land values at the city center and encourage development of those properties. In addition, in places where development pressure is high, density bonuses could be allowed to provide a means to cross-subsidize affordable housing by capturing some of the value that private developers would realize from being able to build more market-rate units on a plot.

109 One systematic approach to identifying public land is laid out in Shirley Ballaney et al., *Inventory of public land in Ahmedabad, Gujarat, India*, World Bank Sustainable Development Network policy research working paper number 6664, October 2013.

Development

Overall, the city needs to increase the supply of housing by 30,000 new units per year. This is an extremely significant challenge in Lomé, where most homes are built by individual owners. Construction methods are basic: even in commercial construction, 95 percent of the work is done by independent artisans. Housing construction costs could be reduced by 10 to 15 percent in Togo by adopting more efficient building techniques. The challenge of making construction more productive in Togo is complex. The nation has a good supply of inexpensive labor, but access to capital for equipment and modern materials is limited. However, some low-cost solutions could be adapted. For example, in South Africa, engineers are exploring ways to mix a small amount of cement with soil to make an extremely cheap building material. In addition to saving on construction costs, this new material has good energy-efficiency characteristics—the material passively cools and radiates heat. Construction with this material may also be able to eliminate the need for steel.[110]

To accelerate adoption of more efficient construction methods, the government can educate the public about lower-cost materials and techniques, including technical guides to different housing typologies. Technical guides can also provide information on ways to improve the quality of existing dwellings to alleviate substandard conditions. Design-to-value strategies can reduce cost, particularly for large-scale construction efforts, or as part of guidelines for independent construction.

Financing

Access to capital for mortgages and construction is limited in Togo. On a macro level, the Central Bank of West African States has a restrictive definition of long-term resources that limits the lending capacity of Togo's commercial banks. Long-term lending by those banks is already at capacity under central bank regulations. Banks also have limited access to deposits since less than 20 percent of the population hold bank accounts.

Further complicating the situation are the many reasons why banks are cautious about real estate lending. First, it is difficult to document or secure a loan. Many Togolese work informally, and landlords receive rents in cash. The inadequate land-registration system makes it difficult to determine whether a particular piece of land can qualify as collateral. In addition, banks have limited ability to enforce contracts. Lack of efficient recourse is an additional risk that discourages lending.

As a result of these factors, only seven out of 12 Togolese banks offer real estate loans and most focus on the commercial sector.[111] Only three offer mortgages with maturities longer than five years, and only one will go out to 15 years—at four percentage points above the base rate. If home buyers or developers can get mortgage loans, the process typically takes two to four years and the rates can be as high as 8 to 10 percent. Although housing-finance product offerings by local banks have been improving, the mortgage market remains underdeveloped, forcing many families to build their homes a little at a time as they can afford to buy supplies.

110 Nancy Stauffer, "Innovative buildings: Prudent use of energy and materials," *Energy Futures*, spring 2009.

111 McKinsey interviews in Togo.

There are ways in which Togo can build real estate financing capacity. The first step would be to create an efficient and comprehensive land-registration system that would provide a way to assure buyers that properties have clear title so transactions can proceed without risk of litigation. Togo can also make mortgage lending more attractive by providing more efficient recourse, training judges in real estate matters, setting up special real estate courts, and introducing arbitration procedures. Because the current length of processing time hinders the prospect for development in Lomé, there is also the potential for the government to create one-stop mortgage processing to shorten approval times and provide technical assistance to Togolese citizens.

Citizens of Togo place a very high value on home ownership, and homes are among the most important assets that a Togolese is able to obtain. Therefore, it is likely that households would respond well to a program to build up savings for their homes. A program such as the Plan d'Épargne Logement in France can give low-income households entry into the banking system and allow savers to accumulate down payments. The state can also provide direct subsidies such as a value-added tax exemption for first-time home buyers and tax deductions for mortgage loan interest.

The Caisse Régionale de Refinancement Hypothécaire de l'UEMOA is a fund that helps commercial banks access capital markets and refinance mortgage loans. Commercial banks lend money to home buyers, and these loans are purchased by investors on capital markets through bonds issued by the fund. It has issued three bonds in Togo so far, worth a total of $100 million, and was expected to issue bonds worth $80 million in 2014, which could include refinancing of affordable housing loans. The fund offers rates of about 6 percent for ten- to 12-year maturities.

The Togolese government is also contemplating something like France's Caisse des Dépôts et Consignations (Deposits and Consignments Fund), which finances long-term projects such as housing. In France, this fund offers banking services, savings funds, pensions, and regional development.

A delivery platform to address the affordable housing gap in Lomé

For the government of Togo to address the Lomé housing shortage, certain enablers must be in place. Even before independence in 1960, government officials were trying to address the housing challenge. After independence, the Togolese government created the Special Housing Development Fund, and more initiatives followed under a series of National Development Plans. Between 1954 and 1994, however, these programs produced fewer than 1,500 units—only 1 percent of the number proposed. Moreover, the units that were built were not an easy sell. Units were available under 15-year leases and were offered to government employees, but they were unaffordable even to senior officials. Meanwhile, Togo did not implement real estate laws and procedures that would have provided a foundation for a more robust housing sector.

Now, Togo has an opportunity to address the shortcomings in housing regulation and policy. Beyond the current public-private partnership for housing, affordable housing development could be accelerated through use of a dedicated delivery unit that would oversee two missions: using public-private partnerships to develop affordable housing projects and creating the regulatory environment to support a robust housing sector. This would require a dedicated public agency, and public-private partnerships—a structure that has been used across Africa.

This housing agency itself can act as a one-stop shop to reduce administrative hurdles and push reforms in the housing sector. The agency can simplify procedures, advise developers, work to improve the real estate business climate, and provide a centralized, simple, transparent, and responsive interface for developers. In addition, it can mediate disputes between other public authorities and private partners and push for modernization of housing administration.

Both "quick fixes" and long-term reforms are needed to start solving the housing shortage in Togo. Short-run interventions include infrastructure investment and rehabilitation work in the slums to address basic needs. In the long run, the greatest cost savings would likely come from reducing or eliminating the cost of land by offering publicly owned parcels for housing development and changing land management processes. Given the limited resources of the Togolese government and low income levels, additional support from private investors, including foreign investors, will be needed to finance development. The government could further facilitate this by simplifying administrative processes, including land registration and permitting times. Eliminating the housing affordability gap in Lomé will ultimately require broader economic development efforts that raise household incomes. Indeed, increased stability in the housing sector, enabled by government action, can be one element of that economic growth.

Singapore: A successful public-sector delivery model

Over the half-century since gaining self-governance, Singapore's comprehensive approach to developing housing has produced more than one million homes, housing more than 80 percent of the population.[112] Our examination of the approach illustrates the four levers of land, development, operations and management, and financing in action, as well as the importance of a strong enabling environment.

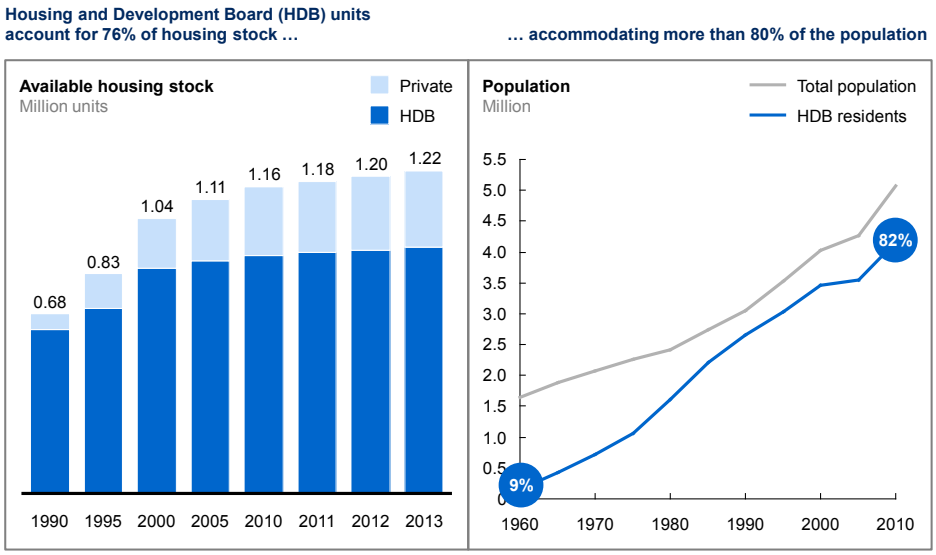
When Singapore's Housing and Development Board (HDB) was created in 1960, less than 9 percent of Singaporeans lived in government housing, and the previous housing agency completed construction at the meager rate of one unit per 150 families each year. More than half a million people, nearly half the population, lived in dilapidated housing or squatter communities. Land scarcity and a growing population strained the housing market even further. In response to this crisis, HDB was ordered to build 54,000 units of housing over the next five years and was given considerable powers in land acquisition, resettlement, development, and design to accomplish this goal.

112 *Households and housing 2013*, Singapore Department of Statistics.

Since HDB met that initial goal, Singapore has continued to expand its housing program to focus on densification and transit-oriented development to increase the available supply of housing to meet population needs for a city-state of 5.4 million (Exhibit 86). Singapore's Housing and Development Board has succeeded in providing housing at affordable rates for a booming population. However, despite HDB's success in providing affordable housing on a large scale, it has been criticized for expropriation of land, limited choices for residents, and low yields for savers in the HDB central provident fund.

Exhibit 86

Singapore housing is dominated by the public sector, with more than 80 percent of the population housed in Housing and Development Board units



SOURCE: SingStat; Housing and Development Board annual reports; McKinsey Global Institute analysis

HOW SINGAPORE USES THE FOUR APPROACHES TO BUILD AFFORDABLE HOUSING

Singapore has employed many of the approaches we outline for reducing the cost of affordable housing. Its HDB agency has been an aggressive assembler of land, has used design-to-value principles, and provides a funding mechanism to expand access to housing finance.

Land

To meet its ambitious goals, HDB first needed to acquire land, a scarce and costly resource in a country that is about 700 square kilometers. In the wake of self-governance and as part of a broader nationalization effort, the government passed a series of laws to expedite the process of acquiring private land. The government's share of land has tripled, from 31 percent in 1949 to more than 90 percent today.[113]

These laws allow the government to acquire property at the current use value, which is often below the market price since the current use is at low density levels and does not account for the full development potential of the land after

113 Country studies/Area handbook series, Federal Research Division of the Library of Congress. http://countrystudies.us/singapore/47.htm.

densification and infrastructure improvements. HDB then acquires this land from the government at a further discount, allowing for a significant reduction in costs. Land is then rezoned to allow for significantly higher density and the government invests in infrastructure development and public utilities in these areas. Typically, HDB residential developments anchor a larger commercial development, which also raises land value. Furthermore, HDB recoups some of the land cost through leasehold sales, under which flats are sold under 99-year leases, with the government retaining ownership of the land.

Development

HDB has also worked to reduce costs through technological innovation in construction, improved procurement, labor management, and process efficiencies (Exhibit 87). HDB's partially privatized development arm, Surbana, plans, designs, and constructs housing developments. Surbana holds a near-monopoly on residential construction and builds on an industrial scale, using standardization, metal formworks, and pre-cast components, often with details and windows included. These practices have raised productivity dramatically. Pre-cast pieces now make up more than 70 percent of total components.[114] HDB also sources stone from its own quarries and works with manufacturers to broker cost-effective deals for other building materials.

Exhibit 87

The Housing and Development Board achieves development efficiencies through industrial scale and careful control of every process

Housing and Development Board contribution across development life cycle

Technological innovation	Improved procurement	Labor management	Process efficiency	Quality control
▪ 70% prefabricated parts, allowing for quick assembly and production at scale ▪ Metal form works for efficient shaping of concrete ▪ Standardization across building types	▪ Owns and manages several supply chains handling most crucial resources ▪ Negotiates contracts and specifications with suppliers in and out of country	▪ Heavily manages licensing and registration process ▪ Trains own workers as necessary	▪ Audits production methods of contractors for efficiency ▪ Streamlines permitting process to avoid delays	▪ Assesses construction against CONQUAS system[1] ▪ Reviews sample set of units for initial rating and then adjusts final payment against the CONQUAS sale

1 Construction Quality Assessment System (CONQUAS) is a construction quality rating system developed by Singapore.

SOURCE: "Provision of public housing in Singapore," in *Good practices and innovative experiences in the South, vol. 2: Social policies, indigenous knowledge and appropriate technology*, Martin Khor and Lim Li Lin, eds., 2001; McKinsey Global Institute analysis

HDB builds standardized housing units, ranging from studios to five-room flats. Customization of select components and fixtures, such as floor finishes and bath fixtures, is permitted, but most design features are standardized to optimize costs.

To ensure quality, HDB has established standards for both materials and labor. Early on, HDB established training programs to bring semi-skilled laborers into the construction industry. All contractors are required to be licensed and registered through the HDB's contractor registry system. The Construction Quality Assurance System was introduced in 1989 to establish standards for structural,

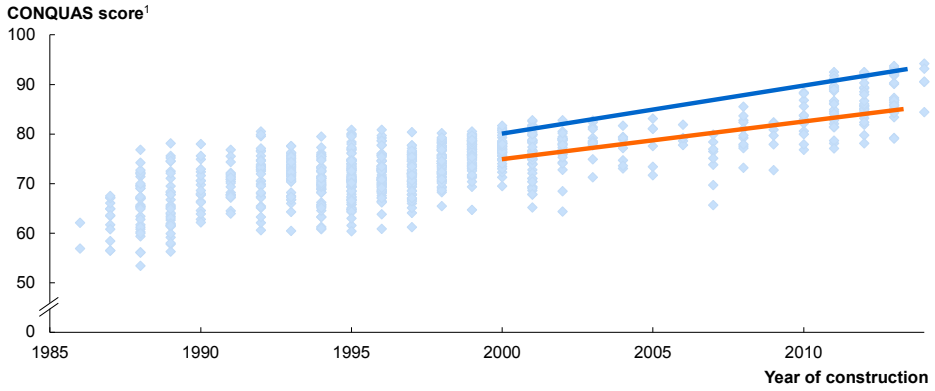
114 "HDB prefabricated building system: A sustainable and green technology," Building Research Institute, www.bri.sg/services/precast-technology/.

architectural, and mechanical/electrical systems in housing.[115] Contractors are penalized or rewarded for how their projects score against the system's standards, and scores are posted online (Exhibit 88).

Exhibit 88

Singapore improved construction quality by setting clear targets, with bonuses and penalties

Quality scores for public housing are increasing in response to government targets



1 Construction Quality Assessment System (CONQUAS) is a construction quality rating system developed by Singapore.
SOURCE: Singapore Building and Construction Authority; McKinsey Global Institute analysis

Operations and maintenance

HDB properties are managed by town councils that control common property in public housing and publicly owned commercial properties within their jurisdiction and supervise maintenance of HDB flats. The 16 councils are funded through government grant money and annual charges to residents that are set by each council. Councils have the scale to pursue cost-saving measures, such as the recent Green Mark program to promote energy efficiency.

Financing

Singapore strongly supports home ownership through its public-housing program and provides subsidized financing. While some flats are available as rentals, HDB has offered the sale of 99-year leases under the Home Ownership Scheme since 1964, and nearly 90 percent of HDB flats are now owner-occupied. These leases are sold only to citizens of Singapore under certain income limits, but then can be resold on the open market under much looser eligibility requirements (often with restrictions only on citizenship and age). HDB uses a combination of subsidy, low-interest loans, and direct savings through the Central Provident Fund, a mandatory government savings account to fund social security payments that dates back to before independence. Since 1968, Singaporeans have been able to withdraw funds from the Central Provident Fund for the purchase of a home (Exhibit 89).

Provident fund contributions are based on wages and employee age and are funded partially by employers and partially through mandatory employee contributions. Employees may also make additional voluntary contributions, with the total annual contribution capped. Central Provident Fund savings can be withdrawn for health care, retirement, education, and select other uses. The

115 Building and Construction Authority, *Construction quality assessment system guide*.

return on these finds is guaranteed to be at least 2.5 percent, but often falls below the market level of investment returns.[116]

Exhibit 89

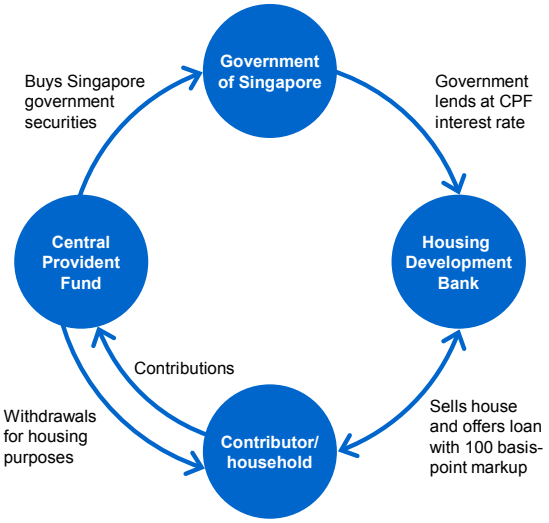
Singapore's Central Provident Fund, a mandatory national savings program, is a major source of housing finance

Employee contribution
- No mandatory contribution for those making less than $400/month
- Under age 50, 20% of monthly income
- From age 50 to 65, donation falls from 18.5% of monthly income to 5%

Employer contribution
- No mandatory contribution for those making less than $40/month
- For employees under age 50, 16% of monthly income
- From age 50 to 65, contributions fall from 14% of monthly income to 6.5%

Central Provident Fund (CPF)
- Interest rates on savings pegged to local bank rates, minimum 2.5%
- Can be used for deposit and monthly mortgage payments
- Housing funds can be taken directly from CPF on negotiated terms

Simplified illustration of Singaporean housing model



SOURCE: Central Provident Fund Board; International Finance Corporation; McKinsey Global Institute analysis

HDB offers mortgage loans to eligible buyers, which are funded by government and offered at the Central Provident Fund saving rate plus one percentage point. By making loans directly from guaranteed funds, the government is able to lower origination costs and the risk premium on housing loans. Buyers are expected to use all available funds (excluding those protected for retirement) for a down payment on a home, further reducing the mortgage risk by lowering the loan-to-value ratio. Typical loans are for 80 percent of the home value with 25-year terms. Monthly loan payments can be covered out of a Central Provident Fund account for up to a 120 percent valuation limit, or the purchase price of the flat. This cap forces some buyers to seek additional financing. Additional subsidies are available to qualified low- and middle-income buyers in the form of HDB housing grants.

Housing delivery platform

HDB housing has two kinds of properties: new homes that are available only to citizens who meet eligibility requirements and homes offered on an open resale market. HDB rental properties are targeted to the lowest-income households, with an income of less than SGD 1,200 per month ($960 per month). They are subject to availability, with allowances for urgent cases. HDB has been working to increase the supply of housing to serve this market and has reduced waiting time from an average of 21 months to eight months.

116 Central Provident Fund Board, 2014 guidelines.

Initial sales of HDB properties are limited to citizens making less than SGD 8,000 per month ($640 per month). Properties are also allocated in proportion to ethnic populations, and flat types are determined by family configurations, as laid out by HDB. Under the Singapore Permanent Resident quota system, Malaysian permanent residents often experience greater wait times than other applicants.

While still considered public housing, much of the HDB housing is sold on the open market. In this resale market, income restrictions are lifted. Without income or price caps in the resale market, prices in those HDB homes are not necessarily accessible to low- or middle-income families. To address the affordability gap in the resale market, the Special Housing Grant was created to assist first-time home buyers with grants of up to SGD 60,000 (around $48,000) to buy housing in the resale or private market.

Singapore's ability to fund affordable housing comes primarily through capturing the value increases on land from densification and urban development by acquiring it for public use at current use value. HDB further passes along only a fraction of the cost of the land to buyers in 99-year leases. Finally, HDB depends on additional public funding; its annual operating deficit is covered by general government funds, which amounts to about 2 percent of the national development budget.

Governance of the housing system in Singapore requires cooperation across several government and independent entities. The Ministry of National Development regulates numerous statutory boards and administrations, such as the Building and Construction Authority, which directly oversees HDB. This process is carefully managed, and to ensure accountability, the Ministry of Finance conducts a biannual review, the public-sector outcomes review, across six key areas of government activity, including public housing. Additionally, the government has managed impressive efficiency levels across administrative processes. Singapore has fully automated the construction permitting process. According to the World Bank, Singapore ranks third in the world in ease of obtaining construction permits. The full process takes an average of 26 days in Singapore, compared with the OECD average of 147 days.[117]

□ □ □

This research was undertaken to promote a better understanding of the affordable housing challenge and how it can be addressed. Because providing affordable housing is such a vast and pervasive problem—and has been growing for so long—it may be difficult to recognize when new solutions are at hand. Indeed, the fundamentals of the four levers for reducing the cost of delivering affordable housing are well known by experts and policy makers in the field. However, we believe that they have reached a stage of maturity where they can be reliably engaged to yield predictable and significant results. Likewise the cumulative knowledge of how cities can design and deliver housing programs that we have presented in the preceding pages has evolved into a practical toolkit. The affordable housing challenge remains enormous, but the means for addressing it are growing in power and sophistication.

117 *Doing business: Measuring business regulations*, World Bank, 2014.

Appendix A.
Calculating the affordability gap

We calculate the affordability gap as the difference between income available for housing and today's annualized market price of a standard unit. When we estimate the total financial impact of the affordable housing gap, we calculate not only the financial overstretch faced by households, but also the annualized capital gains (or losses) of households that bought their housing in the past at lower (or higher) prices and/or lower/higher mortgage rates, the value of existing affordability programs, and the implied annualized cost of upgrading substandard units to standard units. Applying today's market prices reflects the situation faced by new households formed in a city, but it can over- or understate the gap for existing households. For instance, in countries where housing costs have risen disproportionately compared with incomes in the recent past, this calculation may exaggerate the size of the affordability gap, because it does not reflect the costs for households that purchased homes or signed leases before values rose. Or, where values have declined and current mortgage rates are low, current costs could understate the affordability issues of long-term residents.

Note that by looking at the price of standard units rather than median home prices, our analysis focuses on decent living standards for low-income households rather than the financial stretch to provide median housing. In the United States, a median home has more than twice the floor space of a standard unit.

OVERALL APPROACH

Our analysis compares income available for housing and home prices for standard units in more than 2,400 cities. The analysis is based on MGI's Cityscope database, which covers all urban centers with more than 150,000 inhabitants in developed countries and cities with more than 200,000 inhabitants in developing economies. Cityscope has data on population and household growth, GDP, income distribution, and other metrics for over 2,500 cities. We have excluded cities where data on property prices were not available.

DERIVING ANNUALIZED HOME PRICE

The first component of this analysis is estimating standard unit prices. A standard unit of affordable housing, according to our definition, has a minimum floor-area that is socially and politically acceptable in the local context. We define size of a standard unit depending on the income of the country (nominal gross national income per capita in 2012 as defined by the World Bank). We split countries into three major income groups. The high-income group is defined as countries with per capita incomes of $12,746 or above and includes Australia, Japan, New Zealand, North America, Russia, and Western Europe. The middle-income group includes all countries with income per capita of $4,125 to $12,746, which the World Bank classifies as upper-middle-income and includes China, Malaysia, Mexico, and Turkey. The low-income group is made up of countries with per capita income of $4,125 or less. These are mostly countries in sub-Saharan African, South Asia, and Southeast Asia (Exhibit A1).

Exhibit A1

We chose five different standard unit sizes in our analysis to represent variations by region and income

World bank income classification		Range Square meters	Size chosen Square meters	Rationale/source
High income[1]	Gulf countries	120–160	120	▪ In Saudi Arabia private sector and government programs, affordable units are 120–160 square meters
	North America	90–100	90	▪ 90 square meters is the average size of units in New York City public housing ▪ Habitat for Humanity guideline for North America is ~100 square meters
	Western Europe and others	50–70	60	▪ London housing design guideline is 50–60 square meters ▪ German guideline is 60–70 square meters
Middle income[2]	Mexico, Brazil, China	50	50	▪ INFONAVIT standards for affordable housing in Mexico ▪ Low-rent housing standard in China's affordable and social housing policy
Low income[3]	India, sub-Saharan African countries	27–56	40	▪ Recommendation of high-level task force on affordable housing in India

1 High-income group of countries according to World Bank, based on gross national income per capita.
2 Upper-middle-income group of countries according to World Bank.
3 Low- and lower-middle-income group of countries according to World Bank.

SOURCE: New York University Furman Center for Real Estate and Urban Policy; Habitat for Humanity; Royal Institute of British Architects; INFONAVIT; Report of the High Level Task Force on Affordable Housing for All; Housing Development Finance Corporation, December 2008; World Bank; Royal Institution of Chartered Surveyors; expert interviews; McKinsey Global Institute analysis

Sizes of standard units were then set for the purposes of estimating the affordability gap. As noted in Chapter 2, great care needs to be exercised in crafting policies with minimum standards. For low-income economies, we define the size of a standard unit as 40 square meters, in line with the range set by a task force on affordable housing commissioned by the Indian government. For the middle-income group of countries, we use a standard of 50 square meters, which is in line with affordable housing programs in China and Mexico.

For high-income countries, we use a range of standard sizes. For states that are members of the Gulf Cooperation Council, such as Saudi Arabia, we define a standard unit size of 120 square meters. In North America, Australia, and New Zealand, the standard is 90 square meters, which we found to be the average for affordable housing in New York City.

As noted, standard unit sizes are well below median home sizes; the median US home is 222 square meters, according to the 2010 census. The Australian Bureau of Statistics and CommSec reported in 2011 that the average home in Australia is 244 square meters. For Western Europe and Asian high-income countries such as Japan and South Korea, we have defined a standard unit size of 60 square meters, based on housing policies in England and Germany and regional norms in East Asia.

For property prices, we collated data from multiple sources. The main sources were the 2012 UBS Prices and Earnings report; Numbeo, a crowdsourced database that provides prices for rent and purchasing in various cities; Zillow; the US Census Bureau; CEIC data from the China National Bureau of Statistics;

Knight Frank; Jones Lang LaSalle; Notaires Paris Ile de France; and the Japan Housing Finance Agency.

In most cases, we have data from 2012. Where we had 2013 data, such as from Numbeo, we extrapolated back to 2012 based on the Economist Intelligence Unit's home price index. When there were multiple sources available for a city, in most cases the most local source was chosen. In most other cases, the lowest price per square meter was chosen as what a low-income household would typically choose.

Our database has property prices for more than 600 cities. For the other roughly 1,800 cities, we have country averages from Numbeo, which is mostly for the principal cities in a country. To calculate property price for Tier 2 cities, we took half the country average property price. This is in line with the pattern of national averages for Tier 2 cities in China and Mexico. For mortgage interest rates, we used data from International Deposit Rates Exchange and the McKinsey Global Banking Pools database. These data were available for about 70 countries. For the other countries, we used regional averages. To reach the annualized home price, a down payment of 20 percent of the home price and mortgage tenure of 30 years with full repayment of the loan over that period were assumed.

DERIVING INCOME AVAILABLE FOR HOUSING

The McKinsey Global Institute Cityscope database reports number of households by income segment in four income categories defined by annual household income: struggling (less than $7,500), aspiring ($7,500 to $20,000), consuming ($20,000 to $70,000), and global (more than $70,000). These incomes are defined in purchasing power parity terms using 2005 prices. We use post-tax income data, based on expenditure estimates, which is common for estimating incomes in developing economies that have the largest shares of people lacking affordable housing. Within each income bracket, we interpolated the precise income distribution assuming a uniform distribution. To be consistent with local sources and definitions, we used US census pre-tax income data for New York and ten other major US cities. Universally, we define the affordability threshold for housing at 30 percent of household income for estimation purposes.

DERIVING THE AFFORDABILITY GAP

To compare the income segments reported in purchasing power parity terms in 2005 prices and home prices in nominal 2012 US dollar terms, we converted home price in each country into purchasing power parity equivalents in US dollars at 2005 price levels. We used national GDP deflators from national statistics offices, average 2012 exchange rates provided by the World Bank to convert from US dollars to local currency, and conversion factors from the World Bank for converting from local currency to purchasing power parity dollars.

To calculate the affordability gap, we first selected low-income households, defined as those earning 80 percent or less of local area median income. Next, for each income group, we calculated the difference between home price and average income available for housing and multiplied that result with the number of households in each bracket. In case the home price was higher than the income available for housing for only a certain portion of households in a bracket, only those households were considered and average income available for housing was also established accordingly.

Appendix B. Detailed list of sub-levers for affordable housing programs

Throughout this report, we have provided detailed examples of approaches to reducing the cost of delivering affordable housing and for creating effective housing delivery platforms at the local level. In the following tables we compile the various “sub-levers” from the report for easy reference.

Exhibit B1
Strategies to unlock land

Strategy	Tool	Description	Appropriate context	Pitfalls	Cases
Release land for housing	Transit-oriented development	Concentrate and incentivize dense development around transit hubs	Addresses spatial mismatch between housing and jobs; requires significant capital for initial investment	Transit investment raises cost of land, so more cross-subsidy is required to make units affordable	▪ Hong Kong ▪ Dallas (United States) ▪ Denver (United States)
	Release of publicly-owned land	Unlock land supply by selling or leasing strategically-located public land for affordable housing development	Land constraints have led to high prices, and public entities such as railways and military bases are significant landholders within city limits	Stakeholder engagement is time-consuming and challenging; market distortions from oversupply or allocation to sub-optimum; need to ensure transparency in price-setting	▪ Turkey ▪ China
Unlock vacant land	Idle land regulation and taxation	Impose penalties on idle land to discourage speculative land hoarding	Urban land market distorted with significant speculative land holding	Politically sensitive; fair valuation issues; could impact asset rich, cash poor citizens	▪ China ▪ Philippines
Increase land use	Land readjustment	Provide infrastructure across a collection of parcels and redevelop to higher density, including affordable housing; readjust original land holding proportionally	Land ownership is fragmented, lack of infrastructure connectivity dilutes land value, low density use; cumbersome alternative acquisition processes	Time-consuming conversion of readjusted land to housing; readjustment puts execution burden on government to deliver infrastructure quickly; lack of transparency around cross-subsidy could lead to abuse	▪ Japan ▪ South Korea ▪ Gujarat (India)
	Land assembly	Combine fragmented land ownership into contiguous parcel with single title	Used when fragmented ownership prevents appropriate development; Special purpose vehicles (SPVs) can be used to integrate the ownership for the combined parcel	Replacement of individual land ownership with shares in entity owning assembled land might be met with resistance	▪ Peru ▪ Dubai (United Arab Emirates)
	Community land trust	Ownership of land and structure are separated, and community land ownership used to lower unit costs	Legal regime structured to govern community/familial groups or non-profits, with regulations sharing the retained value of land	Equity potential capped for homeowners; trust retains value of land appreciation	▪ United Kingdom ▪ New Orleans (United States)
Improve land registration	Formalization of informal settlements	Formalize informal land holding with individual or collective titles	Significant share of informal settlements; slow pace of redevelopment; low income citizens unable to leverage land as an asset	Land titling can lead to hasty land sales and have a detrimental impact on community integration and long term wealth creation	▪ Peru
	Registration of land titles	Build a land cadaster which registers all land titles and easements providing certainty of ownership	Significant share of land is unregistered; easements and encumbrances unclear leading to illiquid land market	Time consuming to establish ownership, digitize and register all land titles; cumbersome litigation where ownership unclear or contested	▪ Singapore
Reform urban land-use regulations	FAR reforms	Align FARs (floor-area ratios) with infrastructure capacity and zones of increasing density	Overall density of the city is too low or not segmented enough; land consumption across all income segments is more than required	Unless primary infrastructure capacity is aligned, FAR readjustments can have a detrimental effect on existing citizens	▪ Bangkok (Thailand)
	Land use changes	Adjusted zoning to shift land towards highest and best use	Land in strategic locations is not brought forward for development due to land use restrictions that might not reflect market requirements	When done arbitrarily, can lead to uncoordinated development	▪ Mumbai (India) ▪ Hong Kong
	Transferable Development Rights (TDR)	Allow transfer of unused density to another site	Additional density is lucrative for developers in other sites and receiving site can accommodate development	Can lead to segregation; requires enforcement and monitoring to ensure TDR obligations are honored and appropriate development still occurs in targeted areas	▪ Seattle (United States) ▪ Bogota (Colombia)
	Inclusionary zoning	Mandate inclusion of affordable housing as a proportion of select new developments	Liquid market with significant demand for land and upside for market rate units	Land might remain undeveloped if inclusionary elements are too onerous	▪ Barcelona (Spain)
	Density bonus	Provide additional density allowance as an incentive for developing share of land for affordable housing	Sufficient demand for market rate floor space for private developers to justify additional cost of affordable housing	Could become piecemeal approach; requires enforcement and monitoring to ensure developer obligations are honored	▪ New York City (United States)

SOURCE: McKinsey Global Institute analysis

Exhibit B2
Strategies to cut development costs

Strategy	Tool	Description	Appropriate context	Pitfalls	Cases
Remove barriers to efficient procurement	Tariff waivers for building materials	Waive tariffs and duties on import of required building materials for housing	Local supply chain does not exist and import of building materials are expensive due to tariffs and duties	Loss of revenue; ensuring materials are used for intended purposes; preventing build-up of domestic industry	▪ Côte d'Ivoire
	Procurement consortiums	Procure building materials by aggregating volumes across developments and leverage scale to negotiate with suppliers	Developments are sub-scale individually, materials have commodity characteristics whereby they can be aggregated	Requires explicit intervention across a fragmented industry	▪ United Kingdom
Support design standardiza-tion	Uniform building codes	Standardize building code regulations across jurisdictions to enable design standardization	Complex building code variations across jurisdictions dilute design to value opportunity	Stakeholder alignment time consuming; regional nuances and consumer needs should still be reflected	▪ Singapore
	Design and standardization guidelines	Provide standardized design parameters across structure and finishing elements across projects	Public or private developers can execute at scale with repetitive processes with limited customization across projects	Without necessary customization of façade or public realm, communities might be perceived as repetitive or monotonous	▪ Singapore
Support industrial approaches	Support for industrial construction	Support manufacturing type approach to housing construction; enable players and technologies to come into the market	Massive scale is required quickly; certainty of demand can be provided	If there is volatility of demand, capital investments into industrial approaches might not be practical	▪ Turkey ▪ Mexico ▪ Japan ▪ Thailand
Increase productivity	Labor skill building programs	Support industry through labor skill building programs	Shortage of skilled labor in the market	Trained labor is retained and deployed for affordable housing	▪ Malaysia ▪ India
	Productivity improvement programs	Set up mechanisms that encourage innovation and best practice sharing (e.g., demonstration projects, training courses, innovation centers)	Limited knowledge sharing across industry	Capacity of industry to absorb new information and change methods should be weighed against cost of running programs	▪ United States
Innovate in material technology	New building materials	Encourage development of cost-effective and sustainable building materials catering to the affordable housing segment	Local building material supply chain is not fully geared to support the requirements of the affordable housing sector	Need to ensure new products developed are deployed at sufficient scale rather than remaining experimental demonstrations	▪ Brazil ▪ South Africa
Improve competitive landscape	Support for small and medium enterprises (SME)	Adapt contractual frameworks and tender laws to encourage SMEs to build capacity and participate in housing projects	Fragmented real estate sector results in many sub-scale developers and contractors who lack opportunities to incrementally build capacity	Industry capacity building should not come at the expense of poor allocations and failed projects	▪ Saudi Arabia
	New domestic and international players	Encourage new domestic and foreign players to bring in capacity and capabilities to the local market	Local industry lacks specific skills required for housing (e.g., industrial housing technology and processes, asset management experience)	Should be done in a way the incumbents improve their skills through collaboration and competition with the new players	▪ Saudi Arabia ▪ Egypt ▪ India

SOURCE: McKinsey Global Institute analysis

Exhibit B3
Strategies to cut operations and maintenance costs

Strategy	Tool	Description	Appropriate context	Pitfalls	Cases
Support repairs and refurbishments	Repair and refurbishment grants	Establish structured programs to upgrade and refurbish existing homes	Existing homes can be repaired, refurbished and upgraded to meet minimum standards on amenities	Overall aspiration on societal minimum standards might still not be met and this could become a stop-gap solution	▪ Indonesia
	Technical assistance	Provide technical guides and training programs for cost-saving repairs and upgrades	Personal construction is common, and households have resources available for repairs, but not expertise	Non-targeted investment; low income population may not be able to utilize opportunity	▪ Brazil
Decrease cost of operations	Energy efficiency measures	Develop standards for energy efficiency and provide support for capital investments which can help generate energy savings	Energy costs represent significant share of annual expenditure	Subsidies for capital investment might put a fiscal burden on government	▪ United States ▪ United Kingdom
Implement community management	Consortiums for maintenance and services	Organize the maintenance and facility management industry; enable communities to procure services in the most efficient way	Fragmented O&M industry and ad hoc procurement	Requires explicit collaboration across asset management entities	▪ United Kingdom ▪ China ▪ Slovakia
	Homeownership associations /rental management companies	Enable legislation to allow home-ownership associations or rental management companies to more effectively manage assets	Required in most contexts, especially in markets with poor asset management practices that leads to dilapidation and value destruction	Unless provided with the right support structure, such entities are not able to effectively execute asset and facility management functions	▪ United Kingdom
	Fee collection methods	Support pragmatic and practical measures to collect operations and maintenance dues	Defaults from residents are common and limited measures are available to enforce fee collection	Without legal and enabling legislation, even practical measures such as maintenance lumped with utility bills are ineffective	▪ Egypt
Increase industry efficiency	Maintenance-quality standards	Setting and enforcing standards for the quality and safety of housing and funding maintenance programs	Wide-spread dilapidation	Alignment is required on standards across stakeholders	▪ United Kingdom

SOURCE: McKinsey Global Institute analysis

Exhibit B4
Strategies to increase access to finances

Strategy	Tool	Description	Appropriate context	Pitfalls	Cases
Reduce loan origination costs	Standardized property appraisal methods	Align and regulate property appraisal methods to ensure accurate property valuations and appropriate loans	No national property appraisal standards or association of appraisers	Standards must be aligned nationally across all stakeholders (realtors, banks, etc.)	▪ Croatia
	National credit bureaus	Create credit bureau to consolidate data and score individuals based on documented ability and willingness to pay back debt	No credit bureaus or credit bureaus organized at the national level; access to credit needs to be increased	Mandatory participation needed to give bureau credibility and avoid selective participation by large banks	▪ Argentina
	Holistic income assessment	Assess borrower creditworthiness and income across qualitative and traditional factors in order to evaluate unbanked population	Significant proportion of unbanked people or informal sector workers	Data intensive process, requires certain assumptions to be made in the field, and can be highly subjective	▪ India
	Digitized mortgage processes	Standardize and streamline information on credit assessment, mortgage issuance, title registration, and transactions in order to reduce bank overhead	Digital infrastructure exists; bank branch network underdeveloped or costly	Requires technology, infrastructure, and education	▪ China
	Mortgage guarantee funds	Guarantee to compensate lenders and investors for losses due to defaults in exchange for premium paid by lender	Population with currently low incomes and/or low wealth but expectation for growth (emerging markets, veterans, young families); infrastructure to sustain fund	Moral hazard on the part of banks (over issuing loans knowing that they will be covered) and households (borrowing more than they can afford)	▪ United States
Reduce cost of funding mortgages	Mortgage liquidity facilities	Provide wholesale loans to banks based on their loan portfolios, or purchase the portfolios and turn into government-backed bonds	Developed primary market lenders with shortage of long-term funding	Risk of distorting market in the long run	▪ Malaysia
	Covered mortgage bonds	Pool mortgages and offer investors a preferred claim in case an issuer defaults, in order to offer improved safety and relatively high returns	Need for long-term funding of primary market lenders	Insufficient market liquidity and investor appetite, particularly for higher-risk low income loan portfolios	▪ Western Europe
	Mortgage-backed securities	Improve liquidity through securities that pool mortgages and repackage them to investors based on different risk profiles	Established or burgeoning secondary markets with need for liquidity and investor demand	Moral hazard and risk of financial crisis if not regulated properly	▪ United States
	Core Deposits	Improve primary deposit base of banks to conduct mortgage lending operations	Local banking with information intensive loans	Constrained funding and maturity mismatch risk on bank balance sheets	▪ United States
Leverage collective savings	Contractual savings schemes	Reduce cost of borrowing for households by requiring a period of savings at low interest rates	Countries beginning the journey to a stable and robust housing finance market, where savings for housing may not be prioritized	Constrained access to loans; closed schemes do not expand liquidity	▪ Central Europe
	Housing provident funds	Implement mandatory saving scheme, similar to social security, which can provide housing loans at below-market interest rates	Mandatory savings needed and possible with state backing to improve funding options	Poorest borrowers may contribute to the fund without being able to access loans	▪ Singapore ▪ Mexico
Reduce cost of developer financing	Loan guarantees for developers	Provide loan backstop for developers in order to decrease interest rates or increase access to credit	Developer loans costly or difficult to access	Moral hazard on the part of banks over issuing loans knowing that they will be covered, or developers pursuing unsound investments	▪ United Kingdom
	Tax abatement	Waive taxes (often property or sales) for affordable developments	Modest incentive to improve margins for developments	Abuse risk as for all subsidies	▪ Portland (United States)
	Risk mitigation	Mitigate developer uncertainty through buy-back guarantees or post-sale land transfers	Developers exposed to risk that the government is better placed to absorb, such as regulatory approvals, inflation, below-market segment demand	Need to ensure developers retain focus on their core strengths, and risk burden is not overly transferred from developer to public	▪ Cosmo City (South Africa)
	Developer tax incentives	Offer favorable tax policies during construction or tax credits to provide financing for development	Private developers exist but need incentives to focus on affordable development	Ensure incentives do not constitute an unnecessary subsidy or entitlement where development would have occurred regardless	▪ Cosmo City (South Africa) ▪ United States
Improve rental markets	Rental subsidies	Provide subsidy which covers a portion of monthly rent	Assistance to low-income households needed beyond mechanisms to lower the cost of housing	Costly approach, particularly when set up as an entitlement; qualified households may be put on waiting lists when budget is limited	▪ United States ▪ Netherlands
	Renter protection measures	Institute measures which provide additional protections for renters against eviction, rent hikes, and negligent landlords	Particularly relevant in areas with rapid housing price increases and a significant rental market	If regulations are too unfavorable, landlords may convert homes away from rentals; highly protective rent control subject to abuse by tenants	▪ Germany
	Rent to own initiatives	Allow tenants to build equity without having to qualify for mortgage or make initial down payment	Markets where economically solvent households struggle to qualify for loans; strong legal system	Equity wiped out in case of eviction (which has a much lower hurdle than foreclosure)	▪ United States

SOURCE: McKinsey Global Institute analysis

Exhibit B5
Strategies to implement a successful housing delivery platform

Strategy	Tool	Description	Appropriate context	Pitfalls	Cases
Target housing needs and identify beneficiaries	Eligibility database	Build list of potential beneficiaries seeking affordable housing and determine eligibility	Public provision of housing benefits to individual households; large pool of demand	Eligibility verification could be cumbersome and time consuming; risk of misuse/fraud	▪ United States
	Prioritization schemes	Institute logic to prioritize beneficiaries with highest need	Certain segments need explicit prioritization given social and economic situation	Stakeholder alignment for prioritization logic	▪ United States
	Allocation mechanisms	Match various modes of supply with prioritized beneficiary queue	Multiple modes of supply coming online concurrently requiring management of release and allocation of tenants	Risk of misuse/fraud; allocation of units should align with the supply mechanisms	▪ Turkey
Provide consumer assistance	Benchmarks for consumer market	Publicize selected construction benchmarks to consumers	When availability of data on areas such as construction costs can help citizens in building their own homes through contractors	Benchmarks need to be readily available and understandable to target audience	▪ Mexico
	Technical assistance for consumer market	Provide various levels of technical assistance to consumers during housing construction or purchase	Individual homeowners can benefit from standardized contracts, monitoring and quality assurance as they work to build or purchase a home	May be difficult for unsophisticated consumers to access and fully utilize available programs	▪ Brazil
	Builder classification	Classify and organize developers and contractors into segments that highlight their capacity and capability	Fragmented contractor and home-builder market requires transparency to be created on builder capabilities	Requires continues monitoring and updates	▪ Singapore
Choose appropriate delivery model	Developer qualification	Qualify set of domestic and international developers through structured criteria and build competitive market	When both domestic and international developers need to be brought in for housing development with a structured process	Time-consuming process; may inadvertently cut small and medium enterprises out of the market	▪ United States
	Land scoring	Score land parcels for potential development and qualification for appropriate incentives	Incentives are directed to the right developers, but still need to be channeled to the right land parcels	Time consuming process to wide range of potential parcels	▪ United Kingdom
	Public private partnership framework	Develop operating model, tendering process and legal and contractual structure for public private partnerships	Required to organize and allocate risks along the housing value chain to the right owner of the risk across public and private sector	Requires public sector skills and capabilities to monitor and manage	▪ Malaysia
Raise funding from relevant sources	Betterment levies and impact fees	Capture portion of increase in value of assets adjoining infrastructure projects	Useful as a funding source combined with public infrastructure projects	Developer cost passed through to cost of units developed; can raise prices overall or discourage development	▪ São Paulo (Brazil)
	Tax increment financing	Issue bonds against anticipated tax revenues for incremental property value gains, typically used to fund infrastructure improvements	Markets with developed property tax schemes, high government credit ratings, and the need for an initial public cash infusion	If tax revenues do not reach anticipated levels, public is still responsible for covering the debt issued; can be overused	▪ United States
	Public land sales and auctions	Sell or auction public land in measured quantities to raise funding for housing	Sizable public land holding in strategic locations	Permanent loss of a public asset; should be used judiciously, and in strategic locations	▪ Mumbai (India)
	Linkage fees	Charge developers additional fee (based on floor area developed) for new construction which goes into public fund for housing	Markets with high growth and pressure to develop, such that developer profits will cover the exaction	Developer cost passed through to cost of units developed; can raise prices overall or discourage development entirely	▪ Boston (United States) ▪ San Francisco (United States)
	Property value capture	Generate funds for low income housing through revenue generated from mid and high income housing	Government is setup to manage revenue sharing in partnership with private developers	Transparency in ensuring land acquisition and real estate development is done keeping public interests in mind	▪ Turkey
	General taxation	Utilize general tax revenues to fund projects	Sufficient public support and available budget for public housing	Vulnerable to political swings and economic changes	▪ Sweden
Reduce administrative hurdles	Fast-track permitting	Fast track building permits by streamlining requirements and steps	Lengthy or unpredictable permitting processes hurt business plans of developers	Need to ensure quality of process is not sacrificed for speed	▪ India
	Streamlined approvals	Rationalize the number of approvals required to develop housing	When number of approvals and stakeholders involved significantly increase complexity of housing development	Need to ensure quality of process is not sacrificed for speed	▪ Colombia
	Digitized processes	Facilitate cohesive user experience, reduce manual costs, simplify data, and mitigate corruption	Sufficient infrastructure and capabilities	Can be costly without directly attributable savings	▪ United States

SOURCE: McKinsey Global Institute analysis

Bibliography

Allirajan, M., "Easing of external commercial borrowings norms positive for low-cost housing projects," *The Times of India*, June 26, 2013.

Anderson, Scott, and Rochelle Beck, *The big idea: Global spread of affordable housing*, NextBillion and Ashoka Full Economic Citizenship, 2012.

Arnott, Richard, "Time for revisionism on rent control?" *Journal of Economic Perspectives*, volume 9, number 1, winter 1995.

Association for Neighborhood and Housing Development, *A permanent problem requires a permanent solution: New York City's next affordable housing expiring-use crisis and the need for permanent affordability*, spring 2010.

"Attracting private capital into low-income housing market," presented at Harvard Joint Center for Housing Studies International Housing Conference, Bellagio, Italy, May 9–14, 2005.

Avesani, Renzo F., Antonio Garcia Pascual, and Elina Ribakova, *The use of mortgage covered bonds*, IMF working paper number 07/20, January 2007.

Badev, Anton, Thorsten Beck, Ligia Vado, and Simon Walley, *Housing finance across countries: New data and analysis*, World Bank policy research working paper number 6756, January 2014.

Baer, Tobias, Tony Goland, and Robert Schiff, *New credit-risk models for the unbanked*, McKinsey working paper on risk number 30, March 2012.

Baily, Martin N., and Robert M. Solow, "International productivity comparisons built from the firm level," *Journal of Economic Perspectives*, volume 15, number 3, summer 2001.

Ballaney, Shirley, Marie-Agnes Bertaud, Patricia Clarke Annez, C. K. Koshy, Bindu Nair, Bimal Patel, Vidyadhar Phatak, and Vasudha Thawakar, *Inventory of public land in Ahmedabad, Gujarat, India*, World Bank Sustainable Development Network policy research working paper number 6664, October 2013.

Barkham, Richard, and Claudia Murray, *Sustainable social housing: Analysis of award-winning cases*, Grosvenor Group, 2012.

Bento, Antonio, Scott E. Lowe, Gerrit-Jan Knaap, and Arnab Chakraborty, "Housing market effects of inclusionary zoning," *Cityscape*, volume 11, number 2, 2009.

Bertaud, Alain, *Converting land into affordable housing floor space*, World Bank policy research working paper number 6870, May 2014.

Bertaud, Alain, "Housing affordability in China: A stock and flow approach," presented at the Symposium on Low-income Housing in China, Beijing, July 10–11, 2009.

Bertaud, Alain, *Land markets, government interventions, and housing affordability*, Wolfensohn Center for Development at Brookings working paper number 18, May 2010.

Bertaud, Alain, *Mumbai FSI conundrum: The perfect storm—the four factors restricting the construction of new floor space in Mumbai*, www.alainbertaud.com, 2004.

Bertaud, Alain, "Note on transportation and urban spatial structure," presented at World Bank ABCDE conference in Washington, DC, April 2002.

Black, Lamont, Diana Hancock, and Wayne Passmore, *Core deposit funding of subprime mortgages and the effect of monetary policy*, presented at Center for Applied Research in Finance conference on "Business Models in Banking: Is There a Best Practice?" in Milan, Italy, September 21, 2009.

Blood, Roger, "Mortgage insurance," in *Housing finance policy in emerging markets*, Loïc Chiquier and Michael Lea, eds., World Bank, June 2009.

Boston Redevelopment Agency, *Survey of linkage programs in other U.S. cities with comparisons to Boston*, May 2000.

Bowman, Ann O'M., and Michael A. Pagano, "Transforming America's cities: Policies and conditions of vacant land," *Urban Affairs Review*, volume 35, number 4, March 2000.

Boyko, Christopher T., and Rachel Cooper, "Clarifying and re-conceptualising density," *Progress in Planning*, volume 76, 2011.

Building and Construction Authority, *Construction quality assessment system guide*.

Building Research Institute, "HDB prefabricated building system: A sustainable and green technology," HDB website, www.bri.sg/services/precast-technology/.

Calavita, Nico, and Alan Mallach, eds., *Inclusionary housing in international perspective: Affordable housing, social inclusion, and land value recapture*, Lincoln Institute of Land Policy, July 2010.

Case, Karl E., "Investors, developers, and supply-side subsidies: How much is enough?" *Housing Policy Debate*, volume 2, issue 2, 1991.

CECODHAS Housing Europe, Study on financing of social housing in 6 European countries, July 2013.

Cervero, Robert, and Jin Murakami, "Rail and property development in Hong Kong: Experiences and extensions," *Urban Studies*, volume 46, number 10, September 2009.

Chakrabarti, Ritashree, and Junfu Zhang, *Unaffordable housing and local employment growth*, New England Public Policy Center at the Federal Reserve Bank of Boston working paper number 10–3, 2010.

Chiquier, Loïc, "Housing provident funds," in *Housing finance policy in emerging markets*, Loïc Chiquier and Michael Lea, eds., World Bank, June 2009.

Chiquier, Loïc, Oliver Hassler, and Stephen Butler, "Enforcement of mortgage rights," in *Housing finance policy in emerging markets*, Loïc Chiquier and Michael Lea, eds., World Bank, June 2009.

Chiquier, Loïc, Oliver Hassler, and Michael Lea, *Mortgage securities in emerging markets*, World Bank, August 2004.

Chiquier, Loïc, and Michael Lea, eds., *Housing finance policy in emerging markets*, World Bank, June 2009.

City of Dallas Office of Economic Development, *Dallas TOD experience and TOD TIF District: Providing unique public financial incentives for transit-oriented development in underserved areas*, July 16, 2010.

City of New York, *Housing New York: A five-borough, ten-year plan*, 2014.

City of Prince Albert, *Housing Plan*, December 2012.

Clichevsky, Nora, "Vacant land in Latin American cities," *Land Lines*, volume 11, number 1, January 1999.

Cooper, Justin, *Multifamily rental housing: Financing with tax-exempt bonds*, 2nd ed., Orrick Herrington & Sutcliffe LLP, 2010.

Davis, Morris A., and Michael G. Palumbo, *The price of residential land in large US cities*, Federal Reserve Board, Finance and Economics Discussion Series number 2006–25, May 2006.

Dickson, Eric, Judy L. Baker, Daniel Hoornweg, and Asmita Tiwari, *Urban risk assessments: An approach for understanding disaster and climate risk in cities*, World Bank, 2011.

Djankova, Simeon, Caralee McLiesha, and Andrei Shleifer, "Private credit in 129 countries," *Journal of Financial Economics*, volume 84, number 2, May 2007.

Dübel, Hans-Joachim, *CEE mortgage market regulation: Sector risk, regulation and policy issues in Central and Eastern European transition countries, with a special focus on Romania, Serbia, Croatia, Hungary, Poland and Turkey*, Finpolconsult, October 2012.

Dye, Richard F., and Richard W. England, "The principles and promise of land value taxation," in *Land value taxation: Theory, evidence and practice*, Richard F. Dye and Richard W. England, eds., Lincoln Institute of Land Policy, 2009.

The Economist, "Bricks and slaughter: A special report on property," March 5, 2011.

The Economist, "Kenya's slum dwellers: Tangles over tenure," September 22, 2012.

Elliott, Andrea, "Invisible child: Girl in the shadows—Dasani's homeless life," *The New York Times*, December 9, 2013.

Eulich, Whitney, and Lauren Villagran, “In Mexico, low-income homeowners watch their dreams crumble,” *The Christian Science Monitor*, June 26, 2013.

Federal Deposit Insurance Corporation, “Study on core deposits and brokered deposits,” submitted to Congress pursuant to the Dodd-Frank Wall Street Reform and Consumer Protection Act, July 8, 2011.

Feng, Zhe, “China issues land hoarding blacklist,” *Caixin Online*, August 13, 2010.

Fernandez, Warren, *Our homes: 50 years of housing a nation*, Housing and Development Board, 2011.

Fernando, Benita, “An urbanist’s guide to the Mumbai slum of Dharavi,” *The Guardian*, April 2, 2014.

Glaeser, Edward L., and Joseph Gyourko, “How do we know when housing is ‘affordable’?” in *The affordable housing reader*, J. Rosie Tighe and Elizabeth J. Mueller, eds., Routledge, 2013.

Glaeser, Edward L., Joseph Gyourko, and Raven Saks, “Why is Manhattan so expensive? Regulation and the rise in house prices,” *Journal of Law and Economics*, volume 48, number 2, October 2005.

Glaeser, Edward L., and Bryce A. Ward, “The causes and consequences of land use regulation: Evidence from Greater Boston,” *Journal of Urban Economics*, volume 65, number 3, May 2009.

Government of India, *Task force on promoting affordable housing*, Ministry of Housing and Urban Poverty Alleviation, November 2012.

Government of Ireland, Office of the Comptroller and Auditor General Ireland, *Land swap arrangement in the provision of affordable housing*, Report on the accounts of the public services, 2012.

Government of Rajasthan, *Affordable housing policy 2009*, Department of Urban Development, Housing and Local Self Government, December 2009.

Gumaste, Sukirt D, “As JNNURM funds dry up, civic body springs into action,” *Pune Mirror*, June 28, 2014.

Hammam, Sonia, *Housing matters*, World Bank policy research working paper number 6876, May 2014.

Hassler, Olivier, and Simon Walley, “Mortgage liquidity facilities,” *Housing Finance International*, volume 22, issue 2, December 2007.

Helbling, Thomas, and Marco Terrones, “When bubbles burst,” in *World Economic Outlook: Growth and Institutions*, International Monetary Fund, April 2003.

Hill, Desmond, “Precast adoption in Singapore,” presented at seminar on IBS and mechanisation 2012 in Selangor, Malaysia, September 19, 2012.

Ho, Lok Sang and Gary Wai-chung Wong, “The first step on the housing ladder: A natural experiment in Hong Kong,” *Journal of Housing Economics*, volume 18, issue 1, March 2009.

"Housing and schooling," *The Urban Prospect*, volume 7, number 2, March-April 2001.

Howenstine, E. Jay, "European experience with rent controls," *Monthly Labor Review*, volume 100, number 6, June 1977.

Iacoviello, Matteo, *Housing wealth and consumption*, Board of Governors of the Federal Reserve System, International Finance discussion paper number 1027, August 2011.

Industrial and Commercial Bank of China, Annual report, 2012.

Institut für Finanzdienstleistungen and Zentrum für Europäische Wirtschaftsforschung, *Study on interest rate restrictions in the EU: Final report*, 2010.

Instituto del fondo nacional de la vivienda para los trabajadores, *Plan financiero 2006–2010*.

Ishida, Y., "A short history of Japanese land readjustment (1870–1980)," in *Comprehensive Urban Studies*, number 28, Tokyo Metropolitan University, 1986.

Jaipur Development Authority, *Affordable housing policy 2009: Jaipur development*, 2009.

Johnson, Kay, "India slums: 1 in 6 Indian city dwellers live in conditions 'unfit for human habitation,'" Associated Press, March 22, 2013.

Kandt, Jens, "Hong Kong's spatial DNA," *LSE Cities*, November 2011

Katz, Bruce, Karen Destorel Brown, Margery Austin Turner, Mary Cunningham, and Noah Sawyer, *Rethinking local affordable housing strategies: Lessons from 70 years of policy and practice*, Brookings Institution Center on Urban and Metropolitan Policy and The Urban Institute, December 2003.

Keung, John K., "Government intervention and housing policy in Hong Kong: A structural analysis," in *The future of public housing*, Jie Chen, Mark Stephens, and Yanyun Man, eds., Springer, October 2013.

Kim, Kyunghwan, and Phang Sock Yong, "Singapore's housing policies: 1960–2013," presented at Frontiers in Development Policy: Innovative Development Case Studies workshop in Seoul, November 21–22, 2013.

Koh, Benedict S., Olivia S. Mitchell, and Joelle H. Fong, *Collective investments for pension saving: Lessons from Singapore's Central Provident Fund scheme*, Pension Research Council working paper 2010–01, January 2010.

Komives, Kristin, Vivien Foster, Jonathan Halpern, and Quentin Wodon with support from Roohi Abdullah, *Water, electricity, and the poor: Who benefits from utility subsidies?* World Bank, 2005.

Konami, Hirohide, "Japanese efforts to supply low cost housing," presented at 42th EAROPH (East Asia Regional Organization for Planning and Housing) Regional Conference in Ulaanbaatar, Mongolia, September 24, 2009.

Kumar, Raksha, “Bombay slums: Dark, dingy, and full of hope,” *The Express Tribune*, May 4, 2012.

Lipman, Barbara J., “Something’s gotta give: Working families and the cost of housing,” *New Century Housing*, volume 5, issue 2, Center for Housing Policy, April 2005.

Listokin, David, Kristen Crossney, Alan Cander, Tim McManus, Matthew Camp, David Downs, Mary Uschak, Ian Litwin, et al., *Best practices for effecting the rehabilitation of affordable housing*, Center for Urban Policy Research, September 2006.

Liu, Thai-Ker, “A review of public housing in Singapore,” in *Our heritage and beyond: A collection of essays on Singapore, its past, present and future*, S. Jayakumar, ed., National Trades Union Congress, Singapore, 1983.

McKinsey Global Institute, *Beyond Korean style: Shaping a new growth formula*, April 2013.

McKinsey Global Institute, *Nigeria’s renewal: Delivering inclusive growth*, July 2014.

McKinsey Risk Practice, *The national credit bureau: A key enabler of financial infrastructure and lending in developing economies*, McKinsey working papers on risk, number 14, December 2009.

Meyers, Alan, Diana Cutts, Deborah A. Frank, Suzette Levenson, Anne Skalicky, Timothy Heeren, John Cook, Carol Berkowitz, et al., “Subsidized housing and children’s nutritional status: Data from a multisite surveillance study,” *Archives of Pediatrics and Adolescent Medicine*, volume 159, number 6, June 2005.

Milam, Garrett, Bruce Mann, Taylor Carroll, Nicholas Bratton, Jeremy Eckert, and Darcy Newsome, *Analysis of the impacts of transferable development rights programs on affordable housing*, Cascade Land Conservancy, May 2009.

Monk, Sarah, Christine Whitehead, Gemma Burgess, and Connie Tang, *International review of land supply and planning systems*, Joseph Rowntree Foundation, March 2013.

Nairobi News, “Housing shortage looms, warn Nairobi developers,” April 16, 2014.

Nakamura, Leonard I., “Commercial bank information: Implications for the structure of banking,” in *Structural change in banking*, Michael Klausner and Lawrence J. White, eds., Business One Irwin, 1993.

Narayanasamy, Kokularupan, “Cagamas has shown the way,” *Asia-Pacific Housing Journal*, volume 5, number 16, July-September 2013.

National Association of Home Builders, *The local economic impact of typical housing tax credit developments*, March 2010.

National Association of Home Builders, *The local impact of home building in a typical metro area: Income, jobs, and taxes generated*, June 2009.

Office of the New York City Comptroller, *Rents through the roof! A statistical analysis of unaffordable rents in New York City*, September 2012.

Ortalo-Magné, François, and Andrea Prat, "On the political economy of urban growth: Homeownership versus affordability," *American Economic Journal*, volume 6, number 1, February 2014.

Pasquali, Valentina, "The poorest countries in the world," *Global Finance*, September 29, 2014.

Pendall, Rolf, Robert Puentes, and Jonathan Martin, *From traditional to reformed: A review of the land use regulations in the nation's 50 largest metropolitan areas*, Brookings Institution, August 2006.

Peterson, George E., *Unlocking land values to finance urban infrastructure*, World Bank trends and policy options number 7, 2009.

Phadke, Manasi, "For these winners, MHADA flats are high-maintenance," *The Indian Express*, July 4, 2013.

Phang, Sock-Yong, "The Singapore model of housing and the welfare state," in *Housing and the new welfare state: Perspectives from East Asia and Europe*, Richard Groves, Alan Murie, and Christopher Watson, eds., Ashgate, 2007.

Powell, Andrew, Nataliya Mylenko, Margaret Miller, and Giovanni Majnoni, *Improving credit information, bank regulation and supervision: On the role and design of public credit registries*, World Bank policy research working paper number 3443, November 2004.

Quigley, Leo, ed., *Preserving affordable housing near transit: Case studies from Atlanta, Denver, Seattle and Washington, DC*, Enterprise Community Partners, National Housing Trust, and Reconnecting America, 2010.

Rabé, Paul E., "Land sharing in Phnom Penh and Bangkok: Lessons from four decades of innovative slum redevelopment projects in two Southeast Asian 'boom towns,'" University of Southern California, April 2010.

Rabideau, Julie M. Passeio, and Paul A. Toro, "Social and environmental predictors of adjustment in homeless children," *Journal of Prevention & Intervention in the Community*, volume 15, number 2, 1997.

Reifner, Udo, Sebastien Clerc-Renaud, and Michael Knobloch, *Study on interest rate restrictions in the EU*, final report for the EU Commission, Institut für Finanzdienstleistungen e.V., and Zentrum für Europäische Wirtschaftsforschung GmbH, 2010.

Renaud, Bertrand, "The housing finance agenda in developing countries," in *The urbanization revolution*, R. May Jr., ed., Springer, 1989.

Renaud, Bertrand, "Permanence and change: East Asian housing policies after fifty years," presented at International Housing Conference in Hong Kong, February 2–4, 2004.

Rutten, M., *Selling wealth to buy poverty: The process of the individualization of land ownership among the Maasai pastoralists of Kajiado District, Kenya, 1890–1990*, Verlag Breitenbach, 1992.

Sancheti, H. S., “Policy of transferable development rights in Rajasthan,” *India Journal*, volume 8, number 2, April–June 2011.

Sanchez, Aida Caldera, and Asa Johansson, *The price responsiveness of housing supply in OECD countries*, OECD Economics Department working paper number 837, May 2011.

Sandhu, Gurdial Singh, *Initiatives on affordable housing*, Government of Rajasthan, July 2013.

Schill, Michael H., “Regulations and housing development: What we know,” *Cityscape*, volume 8, number 1, 2005.

Sheng, Yap Kioe, “Housing the poor in Asia’s globalized cities,” in *Planning support tools: Policy analysis, implementation and evaluation*, Michele Campagna, Andrea De Montis, Federica Isola, et al., eds., 2012.

Shrivastava, Bhuma, and Sheridan Prasso, “In India, slum dwellers move into high rises,” *Bloomberg Businessweek*, August 28, 2014.

Sperandelli, Daniel Iozzi, Francisco Dupas, and Nívea Dias Pons, “Dynamics of urban sprawl, vacant land, and green spaces on the metropolitan fringe of São Paulo, Brazil,” *Journal of Urban Planning and Development*, volume 139, December 2013.

Stauffer, Nancy “Innovative buildings: Prudent use of energy and materials,” *Energy Futures*, spring 2009.

Stegman, Michael A., “The excessive cost of creative finance: growing inefficiencies in the production of low-income housing,” *Housing Policy Debate*, volume 2, issue 2, 1991.

Stone, Michael E., “What is housing affordability? The case for the residual income approach,” *Housing Policy Debate*, volume 17, issue 1, 2006.

Third World Network, “Provision of public housing in Singapore,” in *Good practices and innovative experiences in the South, vol. 2: Social policies, indigenous knowledge and appropriate technology*, Martin Khor and Lim Li Lin, eds., Zed Books, Third World Network, and UN Development Programme, 2001.

Tighe, J. Rosie and Elizabeth J. Mueller, eds., *The affordable housing reader*, Routledge, 2013.

Turner and Townsend, *A brighter outlook: International construction costs survey*: International construction cost survey 2013, December 2013.

UK Department for Communities and Local Government, *Housing guarantee scheme rules: Affordable housing*, July 2013.

UN-Habitat, *Going green: A handbook of sustainable housing practices in developing countries*, United Nations Human Settlements Programme, 2012.

UN-Habitat, *Scaling-up affordable housing supply in Brazil: The My House My Life program*, United Nations Human Settlements Programme, 2013.

UN-Habitat, *Sustainable housing for sustainable cities: A policy framework for developing countries*, United Nations Human Settlements Programme, 2012.

UN-Habitat, *The challenge of slums: Global report on human settlements 2003*, United Nations Human Settlements Programme, 2003.

UN-Habitat and Cities Alliance, *Housing the poor in African cities: Housing finance—ways to help the poor pay for housing*, United Nations Human Settlements Programme, 2011.

United Nations, Universal Declaration of Human Rights, Article 25, December 1948.

United Nations Economic Commission for Europe and United Nations Human Settlements Programme, *Good practices for energy-efficient housing in the UNECE region*, 2013.

United Nations High Commissioner for Human Rights, *The right to adequate housing*, fact sheet number 21 (Rev. 1), May 2014.

Urban LandMark, *Land release assessment tool: Cosmo City case study*, July 2011.

US Department of Housing and Urban Development, "Measuring overcrowding in housing," *Econometrica*, September 2007.

US Department of Housing and Urban Development, *Mixed-use, transit-oriented development in Arlington, Virginia*, Sustainable Communities eNews, volume 1, issue 4, August 2012.

Usavagovitwong, Nattawut, *Successful approaches to national slum upgrading and prevention, Thailand*, Center for Integrated Socio-Spatial Research Housing Study Unit, working paper number 7, June 2012.

Wahito, Margaret, "Developers seek idle government land," *Capital FM*, June 6, 2013.

Wintour, Patrick, "Ed Miliband issues warning to developers over 'hoarding' of land," *The Guardian*, June 20, 2013.

World Bank Group, *Doing business 2014: Measuring business regulations*, 2013.

World Bank Group, *Doing business 2013: Smarter regulations for small and medium-size enterprises*, 2012.

World Bank Group, *Good practices for construction regulation and enforcement reform: Guidelines for reformers*, January 2013.

World Policy Institute, "This land is your land: A conversation with Hernando de Soto," *World Policy Journal*, summer 2011.

Yip, Ngai M., "Challenges to public housing in post-colonial Hong Kong," in *The future of public housing*, Jie Chen, Mark Stephens, and Yanyun Man, eds., Springer, 2013.

Photo credits

Cover:
New apartments, Hyderabad, India (iStockphoto).
Architects looking at building framework (Getty Images).
Residential building in residential area (Corbis).
Rural Indian children (iStockphoto).

Contents: Slums called Villa 31, in the center of Buenos Aires, Argentina (Shutterstock).

Executive summary: Boy with kite (iStockphoto).

Chapter 1: Guatemala City shantytown (Shutterstock).

Chapter 2: Electric train in Budapest City, Hungary (iStockphoto).
Page 48: Hung Hom, Hong Kong (Getty Images).
Page 74: Crane with a prefab wall at a construction site (iStockphoto).
Page 98: Installing home insulation (iStockphoto).
Page 106: Keys to new home (iStockphoto).

Chapter 3: Developer and construction foreman with blueprints of high-rise project (Shutterstock).

Chapter 4: New generation of public housing in Singapore (Getty Images).

Appendix: China, Anhui province, farmer's home interior (Getty Images).

Bibliography: Favela in Morumbi neighborhood and high-rise buildings, São Paulo (iStockphoto).

Related MGI and McKinsey research

Infrastructure productivity: How to save $1 trillion a year (January 2013)

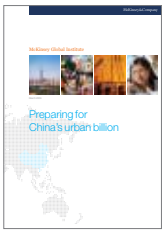
Just keeping pace with projected global GDP growth will require an estimated $57 trillion in infrastructure investment between now and 2030—60 percent more than total spending over the past 18 years. Best practices, such as improving the selection of projects, streamlining their delivery, and making the most of existing infrastructure, could raise infrastructure productivity and save as much as $1 trillion a year if scaled up globally.

Urban world: Cities and the rise of the consuming class (June 2012)

Cities have long been the world's economic dynamos, but today the speed and scale of their expansion is astonishing. MGI explores the phenomenon of urban growth, the one billion people in rapidly growing cities who will become consumers by 2025, and how these consumers will impact demand not only for individual products but also for infrastructure.

From poverty to empowerment: India's imperative for jobs, growth, and effective basic services (February 2014)

India has made encouraging progress in reducing its official poverty rate. But the nation has an opportunity to help more than half a billion people attain better living standards.



Preparing for China's urban billion (February 2009)

By pursuing a more concentrated urbanization path guided by action to boost urban productivity, China's local and national policy leaders would minimize the pressures and maximize the economic benefits of urban expansion. A two-part report details the scale, pace, and global implications of urbanization at the sector and city levels.

Building globally competitive cities: The key to Latin American growth (August 2011)

This report draws on tried and tested success stories from Latin America and around the world to identify tangible actions that the region's city leaders could take to address the highest-priority issues they face.

McKinsey Insight app

Explore insights from across McKinsey, MGI, and the McKinsey Quarterly—all delivered seamlessly to your mobile devices. Broaden your knowledge and widen your perspective on our latest thinking on the challenging issues facing senior leaders, spanning all industries, functions, and geographies. Available for both Apple and Android devices.

www.mckinsey.com/mgi

E-book versions of selected MGI reports are available at MGI's website, Amazon's Kindle bookstore, and Apple's iBookstore.

Download and listen to MGI podcasts on iTunes or at www.mckinsey.com/mgi/publications/multimedia/

McKinsey Global Institute
October 2014
Copyright © McKinsey & Company
www.mckinsey.com/mgi
@McKinsey_MGI
McKinseyGlobalInstitute